

MINING CONGRESS JOURNAL

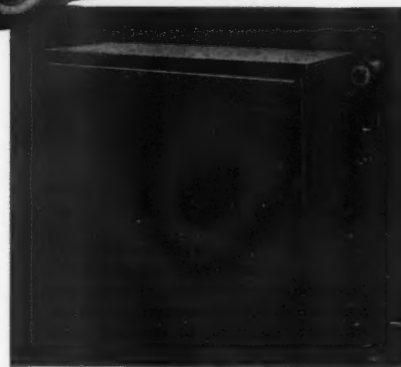
STEEL-ALKALINE DEPENDABILITY



UNDER the heavy mechanical abuse of shuttle-car operation, Edison Batteries with their high-strength steel cell construction give a dependability of operation and freedom from trouble no other kind of battery construction can equal.

Their light weight means more coal handled per kwh, less maintenance and longer life of tires and other parts. They do not require critical charge adjustment; can be charged from d-c lines without need of motor-generators.

They help keep shuttle cars *more continuously available for service—at lower cost.* Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey, U. S. A.



Edison
STEEL
Alkaline
BATTERIES

longer life to rails



Constant pound, pound, pound of loaded cars over rail joints eventually means costly rail replacement and the interruption of traffic.

Thermit Welding of either old or new track lengthens the life of the rail many times and eliminates all joint maintenance.

Moreover, substantial savings in power are effected, as the point on the rail where a Thermit Weld is made actually has greater conductivity than the rail itself.

With a smooth, continuous, welded rail, heavier loads can also be hauled at higher speeds without danger of derailment or spilling of coal. This means more efficient operation of the entire transportation system.

Let us tell you how easy it is for your own workmen to learn Thermit Welding—so that you may apply the many advantages of welded track to your own mine.

Ask for booklet, "Continuous Rail for Main Haulage Track."



*Ask for Murex Heavy Coated
Electrodes for electric arc weld-
ing. Special rods for building up
and hard surfacing.*



Thermit ★ **rail** ★ **Welding**

METAL & THERMIT CORPORATION • 120 BROADWAY • NEW YORK
ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

We have a remarkable Coal Preparation Plant



UTAH FUEL COMPANY
THE CALUMET FUEL COMPANY
GENERAL OFFICES - JUDON BUILDING
 SALT LAKE CITY, UTAH

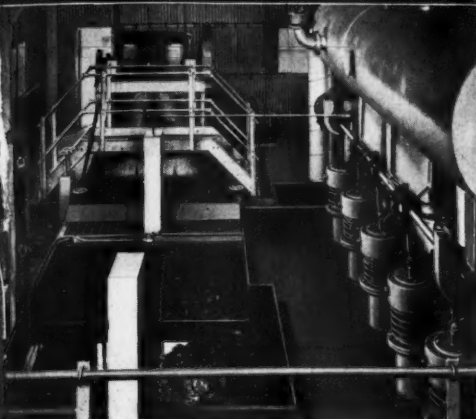
We have a remarkable coal preparation plant. It is very complete and puts us in a much better competitive position. It fully lives up to our best expectations. We are now getting a better realization for our coal than we were before this new plant was built. Dealers everywhere are enthusiastic about the product we are turning out. After an 1800-mile trip around the territory I have found that our washed stoker coal produced in this plant is the brightest spot in the trade throughout the territory.

Claude P. Heiner
 Claude P. Heiner

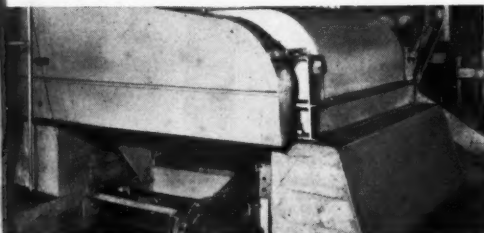
LINK-BELT

COAL PREPARATION PLANTS COMBINE THE MOST MODERN METHODS OF CLEANING,

SIZING, DRYING AND BLENDING



Raw coal belt conveyor from track hopper feeds coal directly into a Link-Belt Air-Pulsated Washer.



Link-Belt type "C" Sizer reduces 3" x 1 1/2" and/or 1 1/2" x 1" washed coal to minus 1".

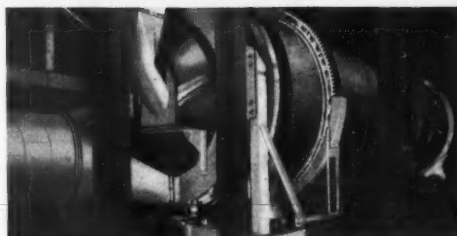
See our EXHIBIT at the COAL SHOW—Spaces 103-108-109-110-111-207-209

● This outstandingly modern Link-Belt designed and built preparation plant shows to what extent management can better its coal quality and its position among dealers. Utah Fuel Co. is one of the numerous producers who have made full use of Link-Belt experience, facilities, and equipment to economically produce coal of low ash and sulphur content with uniform results.

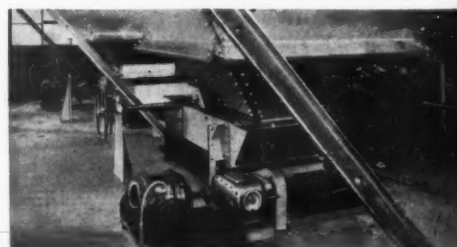
'Link-Belt can give you the best method of accomplishing low-cost, uniform coal preparation. Whether your requirements are a complete tipple, a wet or dry cleaning plant, a heat dryer installation, or some additional unit, or replacement part, consult Link-Belt engineers. Learn also how, as in the Utah Fuel Co. case, immediate tonnage requirements are fully met with provision for future expansion.

LINK-BELT COMPANY

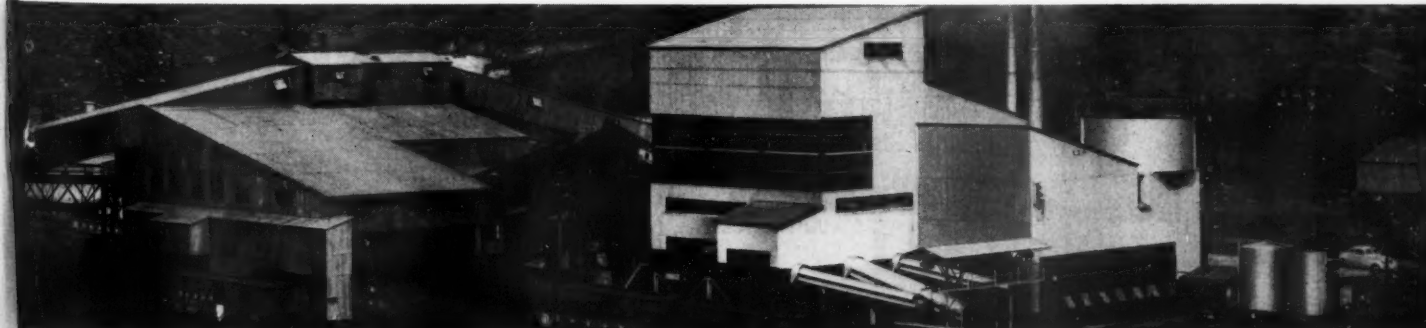
Chicago, Philadelphia, Pittsburgh, Wilkes-Barre, Huntington, W. Va., Indianapolis, Denver, Kansas City, Mo., Cleveland, Detroit, St. Louis, Seattle, Toronto, Vancouver. Other offices, warehouses and distributors in principal cities. 1933



3/8" x 28-mesh coal is fed by gravity from centrifugal dryer to Link-Belt Roto-Louvre Heat Dryer.



Link-Belt P.I.V. Gear provides positive control of reciprocating feeders under washed coal bins, assuring blending of sizes of any desired mixture of washed coal.



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MINING CONGRESS JOURNAL

Vol. 27

APRIL, 1941

No. 4

This month the Journal presents, in addition to feature articles and departments, the complete outline of plans for the Coal Convention at Cincinnati, starting April 28. See pages 31-50.

Next month we will carry a resume of the papers to be given at the operating and economic sessions of the Convention.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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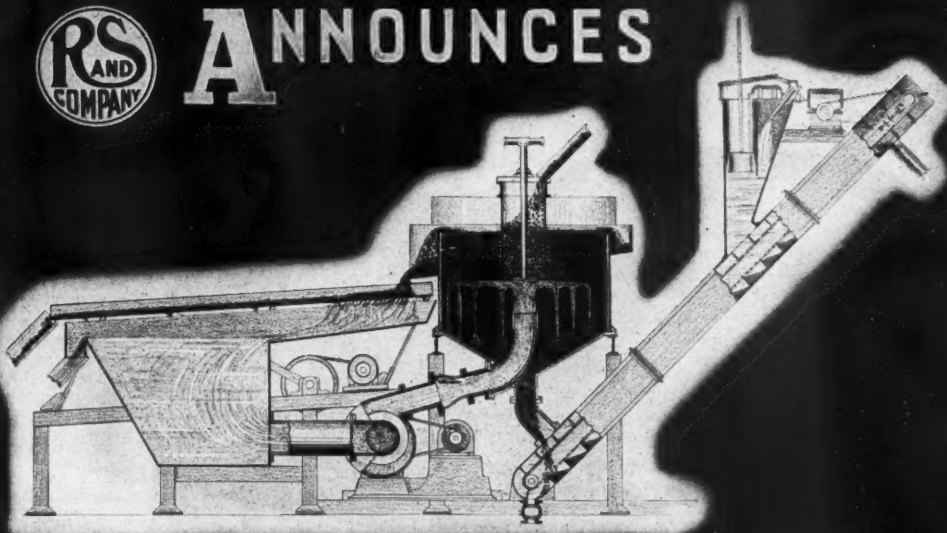
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ANNOUNCES



HYDROTATOR CLEANING and CLASSIFYING

Now Available for BITUMINOUS COAL OPERATORS

ESPECIALLY adapted to economical washing and classification of fine slack coal $1\frac{1}{2}$ " size and under and highly effective on $\frac{1}{4}$ " to 0" sizes, the *Hydrotator* has long been the most favored method for difficult anthracite problems.

A specialized bituminous unit has now been developed by Roberts and Schaefer and is ready for operators interested in equipping for maximum efficiency to meet present market requirements for accurately washed and classified fuel for stokers, by-product coals, etc.



Attention is invited from operators whose refuse contains marketable small coal. The *Hydrotator* method offers a highly efficient and economical means of recovery.

More than 100 units have proven highly profitable for anthracite operators and a complete bituminous unit is now available for testing your production to determine the possible recovery from your nut and slack coals.

Literature and complete details will be promptly furnished on request.

Look us up at the Show—Booths 610-612-614

18th ANNUAL COAL CONVENTION & EXPOSITION, CINCINNATI, O., April 28-May 2

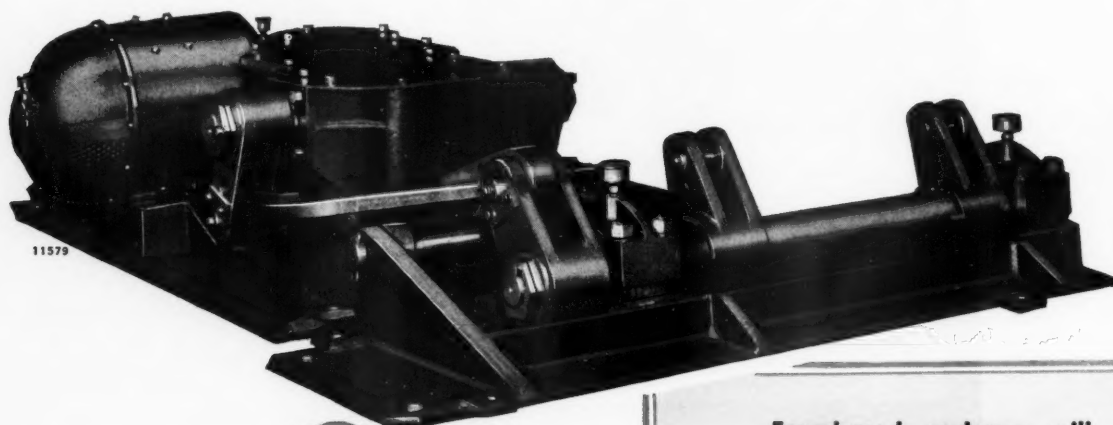
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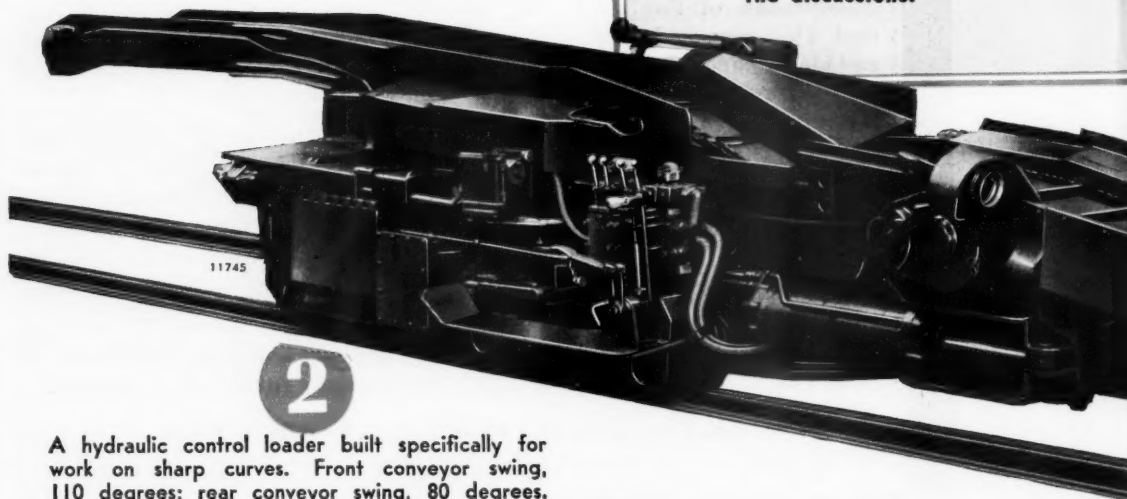
Three New Machines



1

The new side drive attachment adapts the large capacity Type G drives to very low coal.

Experienced engineers will be in attendance to discuss this and other Goodman equipment that will be on display. We invite you to visit our booths and join in the discussions.



2

A hydraulic control loader built specifically for work on sharp curves. Front conveyor swing, 110 degrees; rear conveyor swing, 80 degrees.

Goodman Manufacturing

1
SIDE DRIVE
ATTACHMENT
FOR
GOODMAN
TYPE G
SHAKER
DRIVES

2
GOODMAN
460
TRACK TYPE
LOADER

3
GOODMAN
AUTOMATIC
DUCKBILL

AT THE COAL SHOW
CINCINNATI — APRIL 28 — MAY 2



11015

3

A Goodman Automatic Duckbill converts a shaker conveyor system from one of transportation to one of loading and transportation.

Company

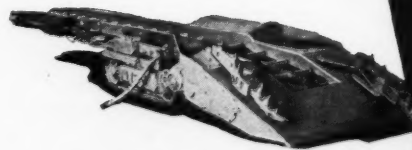
HALSTED STREET AT 48TH
CHICAGO, ILLINOIS





JOY
equipment is the answer
to today's conditions

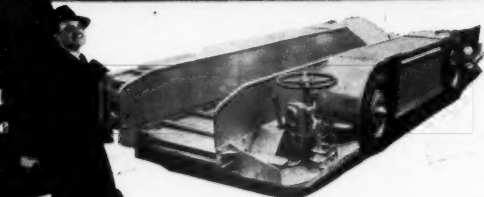
JOY
LOADERS and SHUTTLE CARS
are again cutting mechanical loading
sections costs...from **14** cents
to **20** cents a ton



JOY 14-BU LOADER

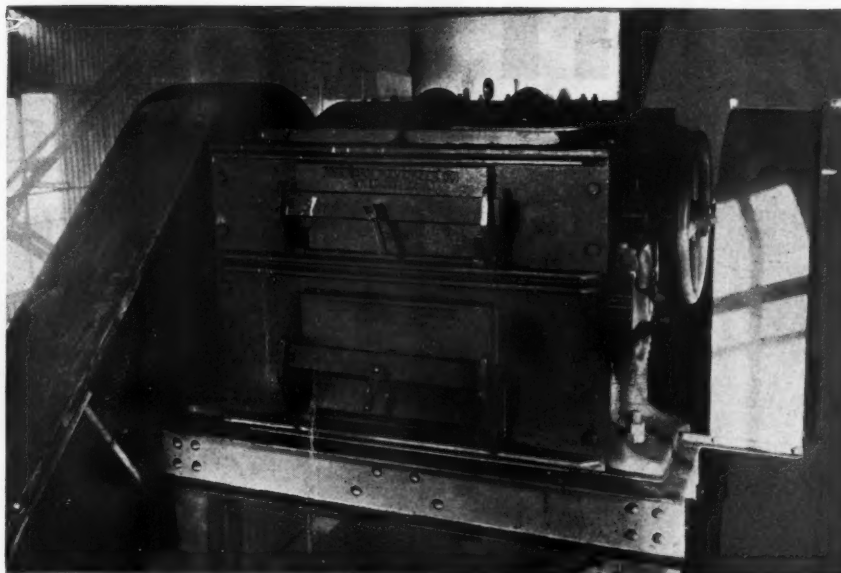
• Your problems are
our problems and we
stand ready and will-
ing to advise and
counsel you to the
best of our ability.

Consult a Joy Engineer



JOY 32-Inch SHUTTLE CAR

JOY MANUFACTURING CO., FRANKLIN, PA.



★ This reversible Manganese Steel Shredder Ring is a patented feature found only in American Rolling Ring Crushers. It splits the coal instead of crushing it, thereby assuring a uniform size of crushed coal. An adjustable grinding plate makes it possible to secure properly sized coal for either stoker or pulverized coal burning. The crusher can be adjusted to make either a maximum or minimum amount of fines.

PRODUCING STOKER COAL SIZES IS OUR JOB . . .

QUICK FACTS ABOUT AMERICAN RING CRUSHER'S MONEY SAVING ABILITY

- Because fines are reduced to a minimum by the action of our patented Manganese Steel Shredder Rings—which *split* the coal instead of crushing it.
- Because power requirements are reduced by this splitting action to a remarkably low figure. American Ring Crushers can be relied upon to reduce bituminous coal from lump to stoker size for less than one cent per ton, *including all costs*.
- The American Rolling Ring Crusher embodies a number of original features in its operating mechanism, which makes it the outstanding Coal Crusher. Simplicity and accessibility were the guiding factors in the American Ring design. These crushers are built in various sizes and types.
- Find out how you can use it and save more money. Write us regarding your coal sizing problems. Our engineers will be glad to tell you the complete facts about this crusher and how its engineering features work to your benefit. Names and addresses of many prominent users furnished promptly on request.

AMERICAN RING COAL CRUSHERS NOT ONLY HANDLE ALL COAL SIZES *but*

when it comes down to 1" or minus domestic stoker coal, American Ring Crushers will do the best job on the basis that it will produce less dust or fines.

READ WHAT USERS SAY

ILLINOIS COAL OPERATOR:

"We are happy to state that the two units we have in service are performing satisfactorily. We have an old American Ring No. 30 which is still in use crushing gob and refuse, a new type A. C. 3-A used for making domestic stoker coal, and also a laboratory crusher."

MIDLAND ELECTRIC COAL CORPORATION:

"It has proved an economical and flexible unit. We have been able, by adjustments, to vary the product from 35% minus ¼ inch to 14% minus ¼ inch, in a 1¼ inch crushed coal."

ANOTHER ILLINOIS PRODUCER:

"We are using two of your AC3-A American Rolling Ring Coal Crushers for producing domestic stoker product. These two Crushers, at different mines, are crushing 2 x 1" and 1½ x ¾" to a product ¾" and under at the rate of approximately 235 t. p. h., and also reducing 2 x 5/16" to a product 5/16" and under at the rate of 150 t. p. h. They are driven by 125-HP. motors. These crushers are more than fulfilling our expectations both in tonnage produced and in quality results in crushing to size. As a good capital investment they have our full endorsement."

AMERICAN PULVERIZER COMPANY

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

1019 MACKLIND AVENUE
ST. LOUIS, MISSOURI

SUNEX

SECURITYFLEX

Anaconda's improved mining cable!

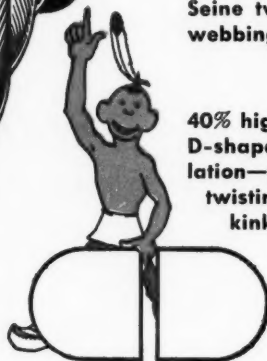
CALLING ALL MINE OPERATORS
... to the American Mining
Congress 1941 Coal Show.
Be sure to visit Booth 820.

Utmost flexibility—
herringbone compen-
sating construction.



Seine twine reinforcement
webbing—prevents tearing
of jacket.

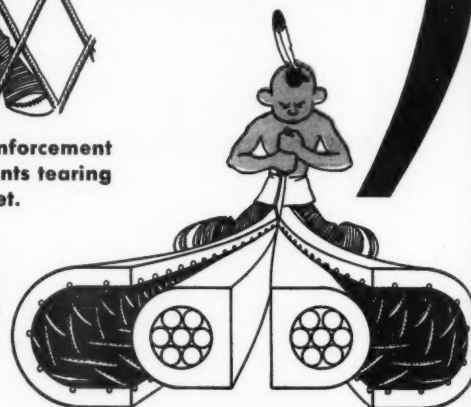
40% high grade
D-shaped insu-
lation—prevents
twisting and
kinking.



Sunex Security-
flex 60% rubber
belt—abrasion,
water, acid and
alkali
resistant.



D-shaped insulation—enables connections
to be made with maximum speed and ec. e.



This picture is of a piece of Type D two conductor Parallel Mining Machine Cable... Securityflex with the famous Sunex jacket is made in all types of cords and cables for every purpose... voltages from 300 to 7,000, shielded and unshielded, single or multiple conductors in different strandings for different degrees of flexibility.

40025



USE MODERN IMPROVED

Anaconda Wire & Cable

ANACONDA WIRE & CABLE COMPANY, General Offices: 25 Broadway, New York City; Chicago Office: 20 North Wacker Drive
Subsidiary of Anaconda Copper Mining Company. Sales Offices in Principal Cities



Coal is also the co-ordinated effort of thousands of executives and technicians and hundreds of thousands of miners, combining brains and muscle, explosives, machines, and materials to extract half a billion tons annually from the ground.

We are proud of our contribution to that effort, and as individuals we value our host of friendships in the coal-mining industry.

We'll be glad to see you at our booth at the
Coal Show in Cincinnati, April 28-May 2, 1941.



EXPLOSIVES DEPARTMENT
HERCULES POWDER COMPANY
Incorporated

WILMINGTON DELAWARE

Here's what an O-B CONTROL *will accomplish for you*

1. Keeps Production Continuous.
2. Prevents Overload Damage—Expensive Repairs.
3. Controls Motor Operation for Efficient Performance.
4. Provides Simplified Foolproof Connection Facilities.

Modern coal mining practice says there are three steps to profitable operation:

- (1) Plan an efficient modernization or mechanization program.
- (2) Install the equipment to make that plan a reality.
- (3) And keep that equipment running.

All three steps are equally important—all must be carried out for "continuous, profitable production."

Important as it is, "Step No. 3" is relatively easy to accomplish, for, with a comparatively small investment, when considered in the light of the expensive equipment it protects and the production it insures, you

can install a complete O-B Protection and Control System which will keep your equipment on the job! Such a system will eliminate expensive repairs from electrical damage, it will keep electrically operated equipment functioning at an efficient level and it will isolate electrical breakdowns.

Let's take a look at the sequence of electrical operations as shown at right! This shows you how an O-B Protection and Control System goes to work. And remember! All these protective items, or their equivalents, can be obtained in gas-proof form! See this system analyzed at the Mining Congress Exposition. Visit the O-B exhibit, spaces 500 to 506.

2268-M



COMPLETE O-B PROTECTION FOR CONTINUOUS PRODUCTION

AND PROTECTION SYSTEM

—and here's how a typical system does it!

1 SECTIONALIZE ALL MAJOR DIVISIONS from each other with an O-B Circuit Breaker or Safety Feeder Switch so that a breakdown in one will not impede production in another.

2 SECTIONALIZE ALL WORKING AREAS within each major division with O-B Fused Trolley Taps or Junction Boxes so that each working area is not affected by electrical mishap elsewhere.

3 SECTIONALIZE EACH CIRCUIT within the working area by means of O-B Fused Junction Boxes so that every cable, every motor and every piece of equipment is protected from breakdowns in adjacent pieces of equipment.

4 CONTROL AND PROTECT MOTORS on conveyors, fans and pumps with O-B Automatic D. C. Motor Starters so that production efficiency is maintained continuously.



MORE FEET OF HOLE PER SHIFT EASIER HOLDING LOWER UP-KEEP COST

The JB-5 A NEW 55 LB. JACKHAMER

THE Jackhamer is a hand held drill. In operating it, human arms, legs and backs become the mounting—thus a man's size and strength limit the drilling capacity.

In the past, few operators had the strength and endurance needed for top performance of a 55 lb. class hammer throughout the shift. The result was less drilling, excessive fatigue and high upkeep costs.

Today's new Jackhamer, the JB-5 is so designed that the average size man can comfortably handle its full power all day long producing more feet of hole per shift with less upkeep costs. Send for Bulletin No. 2734.



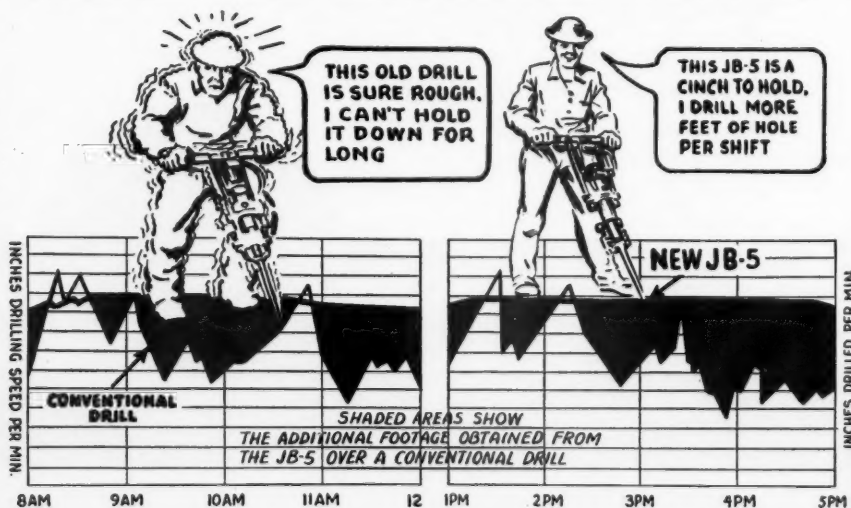
Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

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5-34



8 HOURS DRILLING SHIFT



*See you
at the*

MINING CONGRESS!

THE American Steel & Wire Company exhibit at the American Mining Congress has been for years a favorite meeting place for men interested in modern mining equipment and supplies.

Again this year, as in years past, we invite you to visit our exhibit at the forthcoming Congress, to be held at Cincinnati, April 28 to May 2. We'll be on the main floor in spaces 128-233.



AMERICAN STEEL & WIRE COMPANY PRODUCTS INCLUDE

American Tiger Brand Wire Rope • Excellay Preformed Wire Rope • Tiger-weld Rail Bonds • Electrical Wires and Cables • Amerclad All-Rubber Cables • Bore Hole Cables • Amerglass Magnet Wire • Ampyrol Insulated Wires and Cables • Amerbestos AVC Cables, Cords and Magnet Wire • Trolley Wire • Aerial Tramways • Tiger Wire Rope Slings, Clips and Wire Rope Fittings.



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HEADLINER

WESTINGHOUSE

presents

THE LATEST
IN ELECTRICAL EQUIPMENT
FOR UNDERGROUND MINING

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AMERICAN MINING CONGRESS
Cincinnati, Ohio • April 28 to May 1

★ ★ ★

Exhibit Spaces: 508, 510, 512, 514, 515

Westinghouse

TIME-SAVER FOR THE MINING INDUSTRY

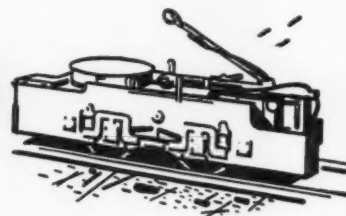


AT THE MINING CONGRESS

Westinghouse brings you new equipment and new ideas to speed coal production and to cut costs. Be sure to see this new equipment in operation at the Westinghouse exhibit.

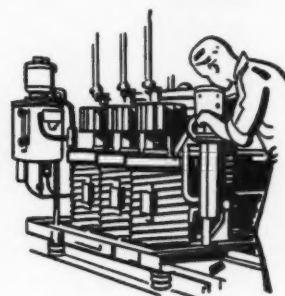
THE NEWEST EXPLOSION-TESTED LOCOMOTIVE

Flush design with no side projections. Unique, double-safe brakes. New 3-point suspension to reduce derailments. Motor-driven vertical axis gearless cable reel. Two multi-torque motors and hand-tactor controller with corrosion preventer. From every angle, the latest and best in electric mine locomotives.



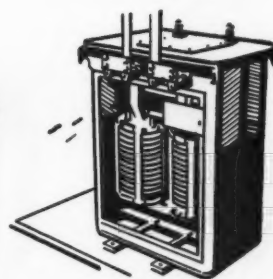
THE NEWEST IGNITRON RECTIFIER

New low cost for underground power. Automatic—needs no expensive foundations—can be moved as required. See how we have improved it for even better results.



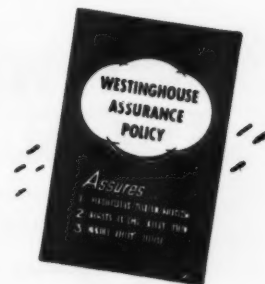
THE NEWEST AIR-COOLED TRANSFORMER

No liquids—designed for efficient cooling, minimum servicing, with high temperature insulation. Can be placed near the load to reduce length of secondary cable runs. No special requirements when planning installations. Field-proved performance.



THE NEWEST IN PRODUCTION INSURANCE

See the special *renewal parts* display—learn from our representatives how you can protect your production against delays with an adequate yet moderate supply of renewal parts for your electrical equipment. Time is money today—and Westinghouse renewal parts will help you save both.



SEE ALL THESE AT THE WESTINGHOUSE EXHIBIT

Examine all this equipment carefully and learn how you can apply it in your own mines. And if for any reason you can't be at the Mining Congress, see our local offices for full details.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

EAST PITTSBURGH, PA.

J-94441



The Jeffrey Mfg. Co.

Cut Overhead

WITH SKF-EQUIPPED JEFFREYS

No danger of bearings running hot nor productive time being lost with this 29-U Universal Coal Cutter . . . no bearing failures to bring up the high cost of repairs . . . and of making them underground. You see, SKF Bear-

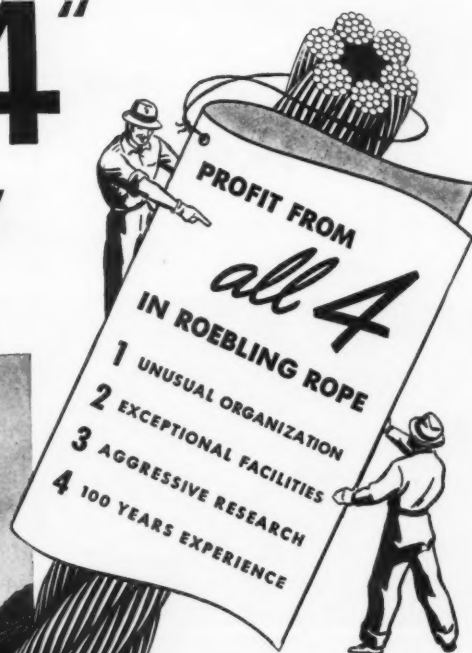
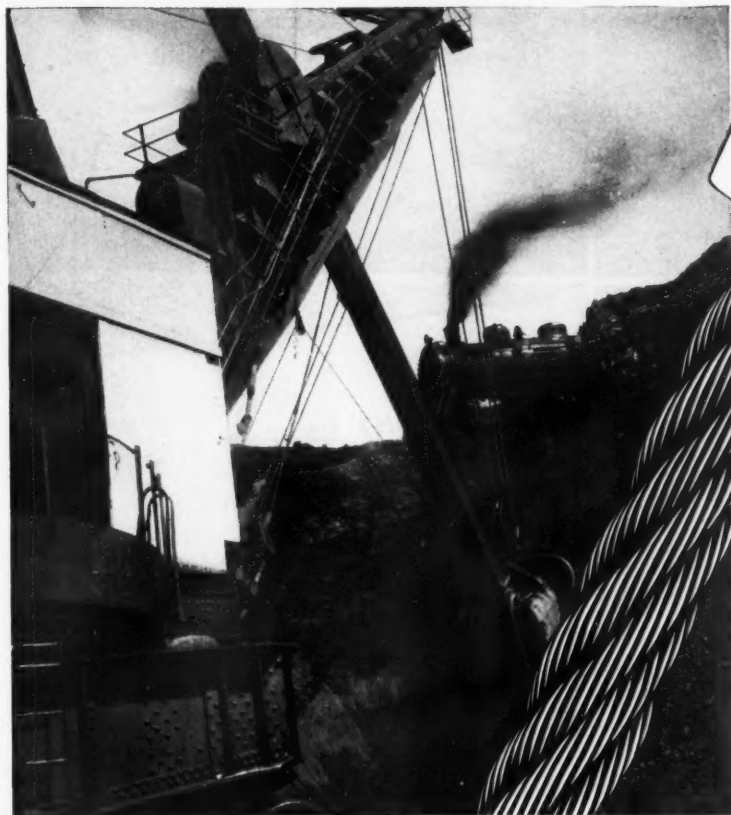
INGS INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

ings are wisely tucked away on vital rotating parts—where bearing accuracy, endurance, dependability, and long life are MUSTS. You say the same thing of the machines you build and use if they're SKF-equipped.

4722

ROLLER **SKF** BEARINGS

THESE ROEBLING "4" count heavily IN ROPE SERVICE



When you buy Roebling "Blue Center" Steel Wire Rope you don't get merely a good rope. You get the finest wire rope that money can buy—a rope that, if used on all your rope-rigged equipment, will assure you of utmost *over-all* rope safety and minimum *general-average* rope operating cost.

Why? Because of the "4" Roebling Advantages listed above—100 years of "Know How" plus everything that modern science, equipment, and organization can contribute.

Ask the nearest Roebling office or distributor for further information.

ROEBLING "Blue Center" STEEL WIRE ROPE



1 *Unusual Organization*—one of country's most complete and experienced wire rope organizations.

2 *Tower of Torture*—An example of Roebling's exceptional facilities is this giant Riehle—one of the largest precision testing machines in the world.



3 *Metallurgical Improvements*—A constant program of wire rope research is carried on in the Roebling Research Laboratory. One of country's finest and most completely equipped research units.

4 *100 Years Experience*—America's first wire rope was made by John A. Roebling over 100 years ago!



JOHN A. ROEBLING'S SONS COMPANY

TRENTON
NEW JERSEY

Branches in Principal Cities Export Division: 19 Rector St., New York, N.Y., U.S.A. Cable Address: "Roebling's", New York

**WHAT'S YOUR
PROBLEM?**

THIN SEAMS?

MECHANICAL LOADING?

THICK SEAMS?

HAND LOADING?

**DU PONT OFFERS YOU THE
RIGHT ANSWER—IN...**

PROVED PERMISSIBLES *for* EVERY PURPOSE

IF your problem is *different*, challenge Du Pont for the answer!

Du Pont has been developing, manufacturing, and selling explosives for 139 years. Du Pont has spent millions in research alone, to help you produce better lump coal at lower cost.

Du Pont has developed no less than 20 different grades and types of permissibles to handle *every* kind of job with utmost efficiency.

Properly handled, permissibles are practically fumeless and smokeless. They produce good lump. They set out the coal in proper shape for mechanical and hand loading.

In Du Pont laboratories, on Du Pont proving grounds, and in coal mines under actual conditions, every grade and type of Du Pont Permissible is carefully *pre-tested*... before it is ever placed on the market.

The result is that when you buy permissibles from Du Pont, you buy permissibles that have *proved* their ability to do a particular job... and do it superlatively well. *E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Del.*

Visit us at 18th Annual Coal Convention and Exposition of the American Mining Congress Music Hall, Cincinnati, April 28—May 1, 1941 Booths 113—121... South Hall

Listen to "Cavalcade of America"... presented by Du Pont every Monday evening over coast-to-coast NBC Red Network



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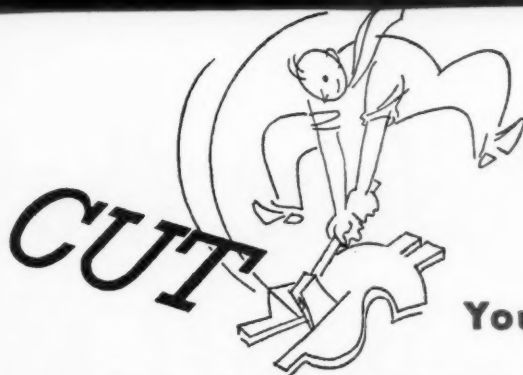
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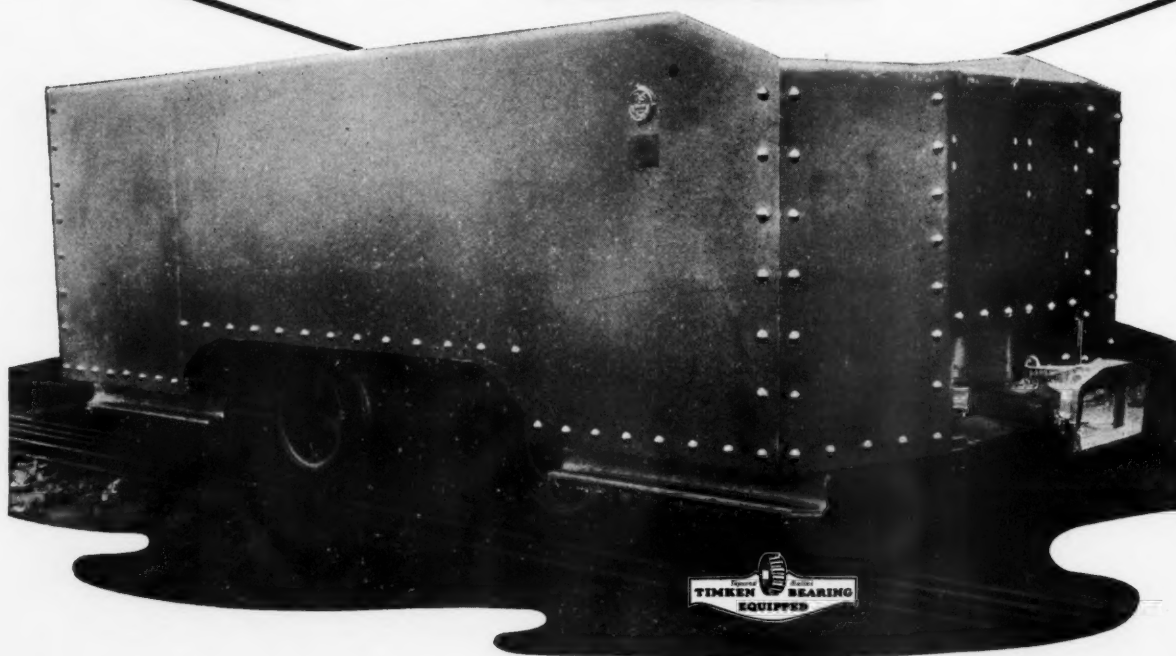
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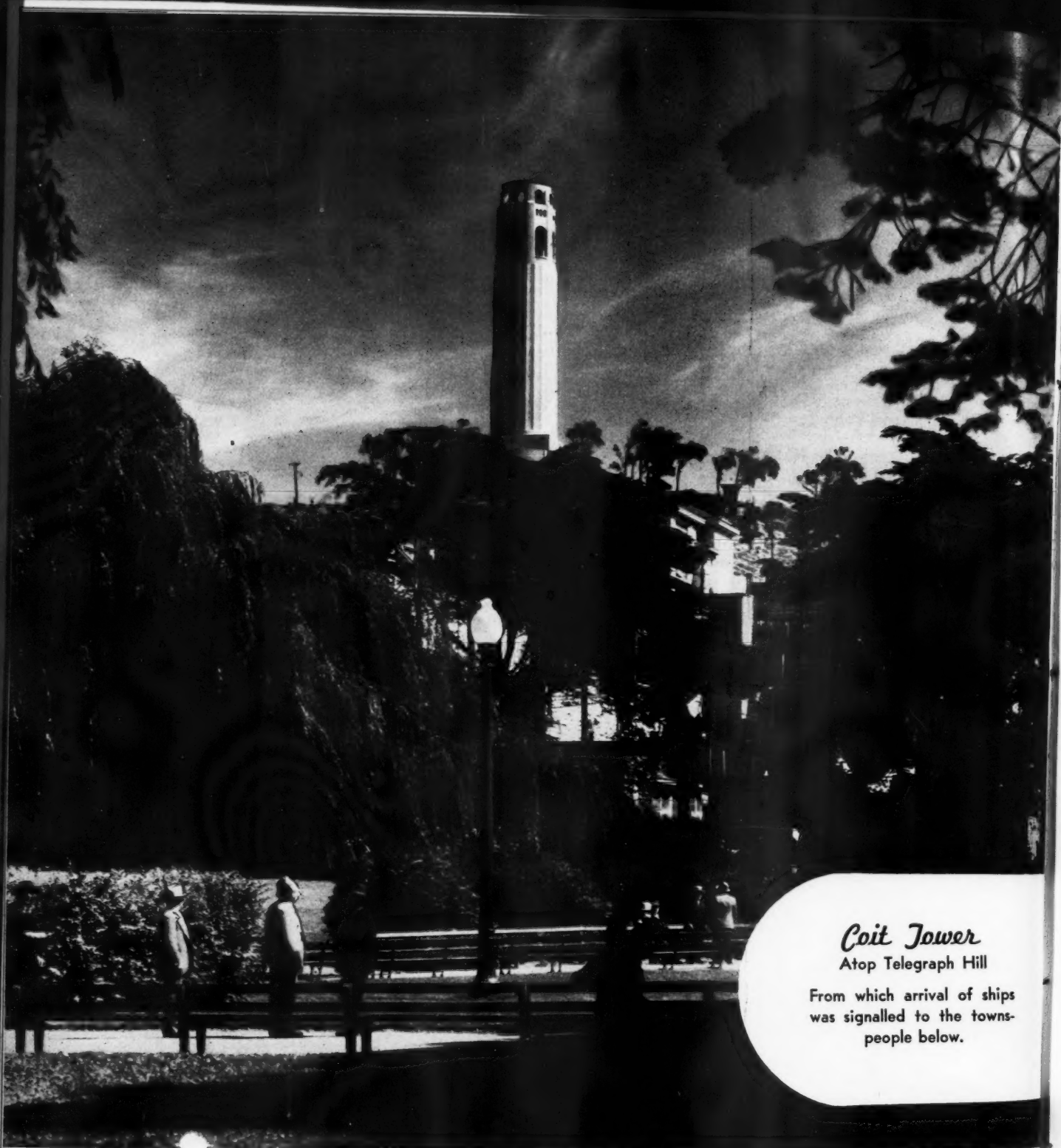


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SEPTEMBER 29 - - OCTOBER 2, 1941

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MINING CONGRESS JOURNAL

RUSSELL C. FLEMING
Editor

Vol. 27

APRIL, 1941

No. 4

WAGE-HOUR MEDDLING

HISTORY tells us that Nero fiddled while Rome burned and it may well be said, when the present domestic and international emergency is over, of those responsible for the administration of the Wage-Hour Act, that they meddled while Britain yearned. In the first place, it was never the intention of the originators of the Wage-Hour law specifically to direct the application of such a measure to the well-paid workmen of the mining industry. They were after the low-wage and sweat-shop conditions of certain industries in the congested metropolitan areas adjacent to our eastern seaboard. But the Act was passed, and another federal bureau was created with a constantly increasing staff of busy minions faring afield like the crusaders of old. Into the coal fields of Pennsylvania went the ardent campaigners and proceeded to tell the miners and the mine managements that the seven-hour face-to-face workday, which has developed from collective bargaining relations of 50 years' duration, should be increased in the computation of hours worked by the amount of time which is consumed in traveling from the surface to the usual working place and back. Action thus taken, against the desire of the miners, would in its final result have added from one to one and one-half hours to the time which must be paid for in computing a workday; and this cost, of course, would necessarily have been added to the price of coal, placing coal at a still further competitive disadvantage with oil, gas and hydro-electric power. The international officials of the Miners' Union answered this meddling quickly and effectively by telling the Wage-Hour Division most emphatically to keep hands off, and the Division made public a release formally approving the face-to-face practice in bituminous coal mines. This same release implied that great weight would likewise be given by the Division to customs and practices of long standing in our metal mines. At this juncture, however, the officials of the International Union of Mine, Mill and Smelter Workers envisioned an opportunity to popularize their organization with some of their metal miner members, and made a request of General Fleming for a blanket ruling which would place the hours of the working shift on a collar-to-collar basis. Fact-finding conferences were conducted at Salt Lake City and Birmingham, and General Fleming has rendered an opinion based largely on reports which contain a number of erroneous assumptions.

Protests from mineral producers, and in particular from the iron ore producers of the Birmingham region, resulted in a further hearing in General Fleming's offices on March 28, where it was shown that, contrary to the assumptions in the report, the collar-to-collar shift prac-

tice is definitely not in general use in the metal mining regions of this country. Producers of practically the total iron ore production of the United States told the Administrator that their practice has always been substantially on a face-to-face basis, and he was also informed by witnesses and communications from the western, central and eastern nonferrous mining regions that the collar-to-collar method is not the general practice. Testimony by a large metal producer at the Salt Lake conference showed that in previous wage negotiations the miners had abandoned their request for a collar-to-collar shift in favor of a pay increase.

The warning note by a representative of the O. P. M., that every effort should be made to avoid interference with defense production, adds final weight to the facts upon which the Wage-Hour Division should immediately act to abandon its ill-considered opinion. If persisted in, this opinion will not only increase costs of vitally needed defense materials but will stimulate the filing of thousands of suits for alleged back pay, at great cost and confusion to the whole industry.

Meddling tactics should be stopped instantly, in order that every shoulder in the mining industry may be exerting its maximum of power behind the national defense wheel.

* * * *

AN OPEN LETTER

TWO months ago a letter was sent to all JOURNAL subscribers requesting comment and opinion on the contents and policies of the magazine.

The response has been remarkable, not only in the large number of replies but also in the thoughtful and constructive nature of the comment. All sections of the country and all branches of the industry were represented in the replies, as well as all classes from management and operating personnel to muckers and coal loaders. Readers with special interests in one branch or another of mining, have almost unanimously recognized and approved the balance to be maintained between coal and metal mining, between economics and articles on mine operation. Many specific suggestions were received for definite articles or features. Keen interest was shown in the economic side of mining and in governmental policies and agencies relating to the industry. Geologists were particularly vocal in wanting more relating to their interests. Very few bricks were thrown, and those few were as constructive as the many more approving responses.

One point of policy raised was whether a reader's forum, where comment and opinion could be aired, might be a welcome feature. Many said they would like to see that in the JOURNAL, but a larger proportion were of the opinion that such a forum may become the sounding board of extremists and fanatics, leading to bickering and ill-will, and that the disadvantages outweigh the advantages.

This cross-section of opinion on the part of our subscribers will be of great help in building a constantly better JOURNAL. We take this opportunity to thank those who wrote, for their thoughtful and generous response, and trust these thanks will reach all except the three who acknowledge that they never read editorials.



Fig. 1. Shales over-lying Sewell seam, showing variation in vertical section. State Route No. 21 and 61, Mount Hope, Fayette County, W. Va.

Investigation of

MINE ROOF DETERIORATION

THIS paper will discuss a study that has been made during the past year relative to the physical and chemical properties of the shale roof rock over-lying the Sewell coal in the mines of the New River Company located in Fayette and Raleigh Counties, West Virginia. Geologically this seam of coal belongs to the New River group of the Pottsville series, Pennsylvania System. This study is being conducted to ascertain the efficiency of sealing material in retarding disintegration of the roof shales.

The New River Company through its selling organization, the White Oak Coal Company, will market this year approximately 3,750,000 tons of coal. The greater portion is recovered by the conventional room and pillar system of mining. The coal averages 42 in. in thickness, which necessitates the brushing of all mains and cross entries and the taking of "slate" in most of the rooms.

Types of Roof Overlying the Coal

Immediately overlying the coal is usually found a section of lithified muck, "bone coal." This "bone" varies from a fraction of an inch to several inches in thickness and is micrograined and homogenous. When laminated with coal it is known locally as "rash." This sapropelic deposit, where conditions were favorable as in certain sections of Webster County,

- *The New River Company, Confronted with a Serious Problem in Roof Deterioration of the Sewell Seam, is Making a Scientific Study of the Causes and Cure of the Condition.*

By H. B. McNARY
Consulting Engineer
The New River Company

W. Va., grades into cannel coal (Fig. 2). The deposition of the "bone-" and cannel-forming sediments marks the end point of the Continental and the beginning of the Marine period of sedimentation, as indicated by the marine fossils associated with the primary roof of the coal. The majority of these sediments were mud that, due to pressure, have been lithified to shales. Because of changes in environment during sedimentation, the physical and chemical characteristics of the shales vary greatly throughout a vertical section (Fig. 1). In some parts of the mines a portion of the primary roof consists of an extremely hard sand stone. Where this condition is found it is believed that the original shales or muds were removed before lithification by stream erosion or wave action and were replaced with sand (Fig. 3). Water moving at sufficient velocity to

carry and sort the sands could easily erode the recently precipitated muds; in fact, there is sufficient evidence to support the theory that in places the coal was also eroded and replaced by other sediments, and these are known locally as "faults." The shales under consideration, those making up the primary roof, vary upward to 35 and 40 ft. in thickness.

Mining Practice and Roof Action

In mining the practice is to undercut, shoot and remove the coal. The roof rock is then drilled and shot down to the required height (Fig. 3). In this manner the shales are exposed, and within a few months the section above the shot line begins to come down. The shales show evidence of swelling and they break away from the roof in pieces and slabs (Fig. 6); these vary from pieces of coin size to falls suffi-



Fig. 2. Sewell seam showing 2 in. of bone overlain by 13 in. of cannel. Paulceal Mine, Webster County

period of time. Since gunite has relatively little structural strength, it would seem that the success of its application is due to sealing the shale from air and atmospheric moisture. This line of thought is further supported by observation of roof action where no top is being taken, as in conveyor mining where the bone coal is held by timbers and due to its homogenous character does not readily admit the mine atmosphere to the shales. However, as soon as this bone is broken, the shales immediately begin to disintegrate.

Study Being Made of Basic Causes of Roof Deterioration

While the above observation apparently indicated that the solution

or partial solution to the problem was to find an economical sealing agent, it was felt that to approach the problem properly the basic cause of the disintegration of the shales when exposed to mine atmospheres should be known.

The author is indebted to Dr. Paul H. Price, West Virginia State Geologist; Dr. James H. C. Martens, mineralogist; Dr. A. J. W. Headlee, chemist, State Geological Survey; and Mr. Alvin Miller, Division of Tests, State Road Commission, for their contributions towards the analysis of this phase of the problem.

This work has only just begun and while no definite conclusions can be drawn, the findings thus far are indicative of possibilities.

Three forces have been recognized as contributing factors to the deterioration of the roof. Two of these are problems in structural geology and the third, which is of immediate interest,

cient to fill several mine cars. This action continues until a natural arch retards the action or the caving is stopped by a sandstone or dense roof structure. After arching the action continues at a retarded rate to heights that occasionally go to 30 or 35 ft. above the coal. Within a few days a section 6 to 10 in. thick from 2 to 12 in. down from the top of the coal begins to show evidence of compression (Fig. 4). "Brows" begin to fall away from the rib and as time goes on the entire face of the rib becomes loose and shows much evidence of shattering. The rate of disintegration varies somewhat with changes in humidity but this seasonal action is not nearly so marked as has been observed in other seams of coal.

Possible Causes and Cures of Roof Deterioration

Many suggested cures have been put forth to relieve these conditions, among which are: Air-conditioning, guniting and various systems of timbering and mining. Since this action takes place in entries and air courses that are being driven in virgin coal it cannot be concluded that dynamic forces set up by the removal of the coal is wholly responsible for the roof action. We know from experience that when this type of roof has been sealed with gunite the sloughing action usually ceases. However, due to its cost, gunite has not found general use except in sections of the mine that must be maintained for a considerable

Fig. 3. Right—Three ft. of sand rock overlain by shales, Cranberry mine, The New River Co., Raleigh County



Fig. 4. Below—Sewell coal and shales, Cranberry mine, The New River Co., Raleigh County. Note fracture line, near top coal, produced by compression due to expansion of shales

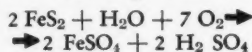




Fig. 5. Thin section of strata showing imbedded pyrites

is apparently due to forces created by chemical reaction.

The shales contain heavy concentrations of micaceous minerals such as muscovite, illite, large amounts of siderite, iron pyrites, silicon dioxide, aluminum oxide, titanium dioxide, manganese dioxide, iron oxide, calcium oxide, magnesium oxide and others. A great many of these minerals, when exposed to atmospheric oxygen, undergo a chemical change. More study has perhaps been given to the mechanics of the oxidation of iron pyrites than to any of the other minerals named and it is generally accepted that the chemical reaction proceeds according to the following formula:



The ferrous sulphate is further oxidized to produce ferric hydroxide and sulphuric acid. The ferrous sulphate being deliquescent steadily absorbs moisture from the mine atmosphere and becomes hydrated. The swelling of the ferrous sulphate is practically irresistible and where it occurs a steady disintegration of rock structures will take place.

As stated before, little study has been given to the action of other minerals in this respect, but it can be presumed that the same phenomena will attend other types of hydratable materials.

Since most rocks are pervious this action is not wholly a surface phenomena but probably continues at a diminishing rate back from the newly exposed rock face. If the forces resulting from chemical action are an important factor in roof disintegration it follows that the solution lies in keeping the air from reaching the minerals involved.

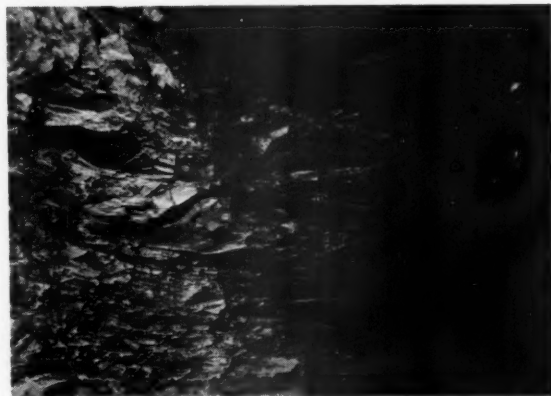
Means of Sealing Structure Following Exposure to Be Tried

A great many materials were considered for the purpose of sealing the structures and at the suggestion of Mr. Miller it was decided to experiment with emulsified asphalt. Accelerated weathering tests have been conducted in the laboratory, using treated and untreated samples of shale, and these tests indicate that an asphalt emulsion consisting of 40 percent water and 60 percent semi-solid oil asphalt, with a flash point of residue approximately 400° F., will probably be the most efficient and economical.

materials pressure of from 35 to 40 lbs. The asphalt will be supplied from a steel cylinder which is to be mounted in the mine car which carries the water and tools for the rock drillers. It is planned to spray the ribs and roof after each cut of rock has been loaded out. This is to be done by the rock drillers.

As these experiments continue there will no doubt be variations in this procedure and at the same time it is hoped that research can be continued. There is apparently a broad field of study relative to this subject in which the geologists, chemists and physicists can be of great aid to the industry.

Fig. 6. Section of rib and roof disintegrated to a height of 8 ft. above the coal, located 100 ft. back from the face in solid coal, Cranberry mine



This emulsion is hydrophilic and can be applied either to wet or dry surfaces. It is planned to apply this asphalt emulsion with a Devilbiss Style MBC spray gun, equipped with a No. 20 FF cap and nozzle. This will probably be sprayed on with an air pressure of from 50 to 60 lbs. and ma-

REFERENCES

Geological Survey—Volume No. 10, by Paul H. Price; *Technical Publication No. 769*; American Institute of Mining and Metallurgical Engineers, by Stephen P. Burke and Richard Downs; *Principles of Sedimentation*, by W. H. Twenhofel.

New Standards Adopted For Allowable Concentration of Carbon Monoxide in Air

Upon recommendation of the Committee on Toxic Dust and Gases, American Standards Association recently gave approval to four new American standards. These defined the amount of carbon monoxide, hydrogen sulfide, carbon disulfide and benzene, respectively, which may be permitted in the air of work places without harm to workers. The standards were adopted to serve as guide posts of the limits which must not be exceeded if the health of the person exposed is to be preserved.

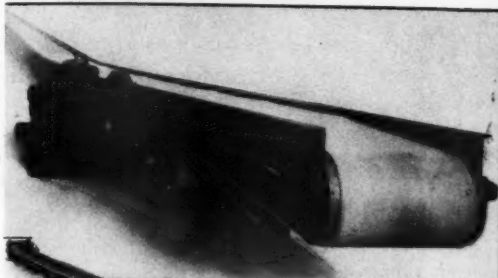
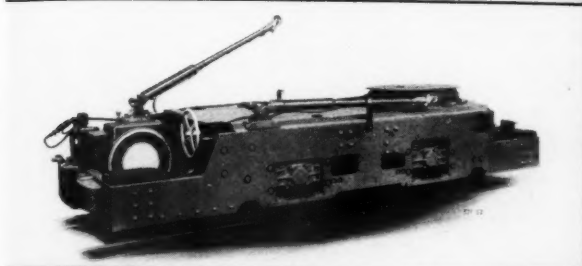
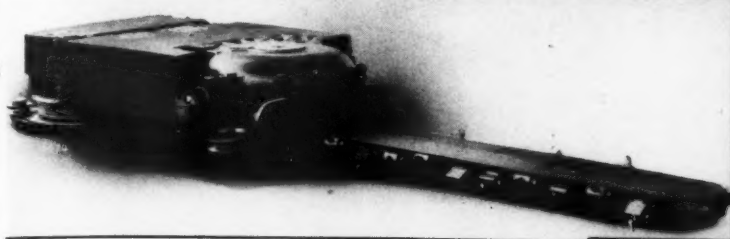
Of particular interest to mining was the standard relating to carbon monoxide. As adopted, this provides that the maximal allowable concentration of carbon monoxide shall be 100 parts per 1,000,000 parts of air by volume, with atmospheric oxygen not

below 19 percent by volume adjusted to 25 C. and 760 mm. pressure for exposures not exceeding a total of eight hours daily, and 400 parts per 1,000,000 parts of air by volume for exposure not exceeding a total of one hour daily.

Mr. William P. Yant, Director of Research and Development of the Mine Safety Appliances Company, Pittsburgh, was recently elected chairman of the Sectional Committee on Toxic Dusts and Gases.

Iron Mine Acquired By Pittsburgh Coke & Iron Company

Announcement has been made by the Pittsburgh Coke & Iron Company, Pittsburgh, Pa., that the assets and business of Davidson Ore Mining Company, with mines at Iron River, Mich., have been acquired, and will be operated as a division of that company.



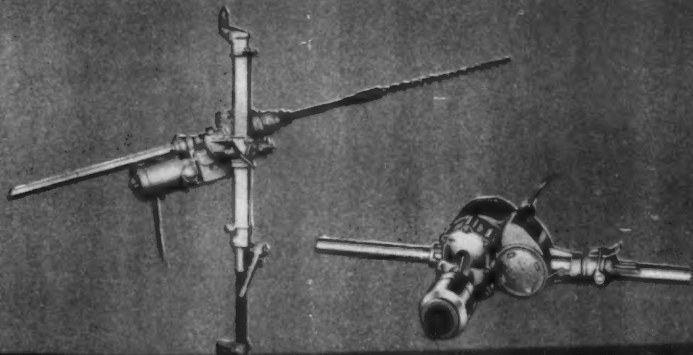
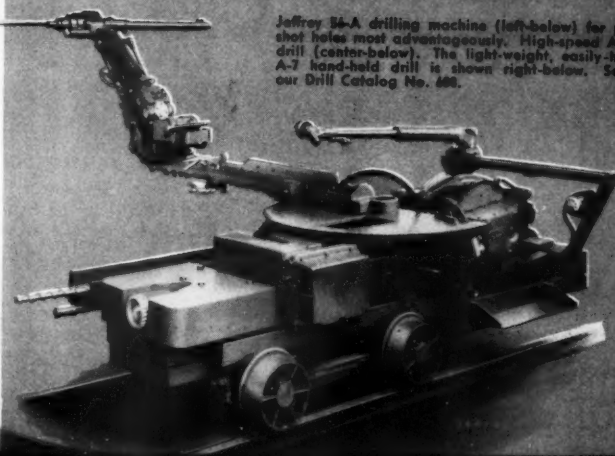
Jeffrey 29-U universal coal cutter (above) for cutting any where in the seam. (Patented and Patents Pending — also licensed under E. C. Morgan patents — 170,494-62, 170,713-33, 170,325-26)

Jeffrey 25-L low-vain, continuous duty shortwall coal cutter (above). 50 H.P. motor — a low-priced modern unit.

Jeffrey 8-ton explosion-tested, cable reel gathering locomotive.

Jeffrey underground mine conveyors reduce the cost of getting out coal. A face, room and entry conveyor are shown at the left. The Jeffrey 41-line of mine conveyors — chain or belt types — will speed up production — make it profitable. Catalog No. 745.

Jeffrey 34-A drilling machine (left-below) for placing shot holes most advantageously. High-speed A-3 post drill (center-below). The light-weight, easily-handled A-7 hand-held drill is shown right-below. Send for our Drill Catalog No. 688.



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A machine of action with extraordinary gathering and handling capacity.

For low seam mining — 31 inches high — cleans up a 28-foot room.

Finger-touch hydraulic controls, including tram control.

50 H. P. motor provides power for all movements.

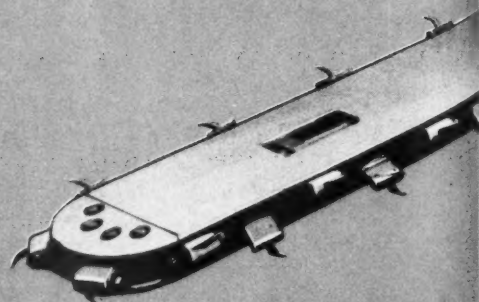
High capacity — same powerful digging action as the Jeffrey L-400 loading machine.

Transmission enclosed in oil-filled case.

Spring-mounted journal with Timken bearings.

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The **43-L SHORTWALLOADER**

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SEE—In Jeffrey Movie

A continuous mining and loading machine
— cuts ahead while it loads a cut behind.

Skids on the floor like a shortwall.

Loads its cuttings from the advance cut
and the shot down coal from the cut behind
— in one trip across the face.

Delivers coal to Jeffrey 61-W chain conveyor
to which discharge end is anchored by a
movable buggy riding flared sides of the
conveyor.

Produces maximum speed of advance —
highest tons per man in low coal.

Bulletin No. 754

Discharge end of the 43-L
showing how it is anchored
by a movable buggy or four-
wheeled centering truck,
which rides the conveyor
below.

617-40

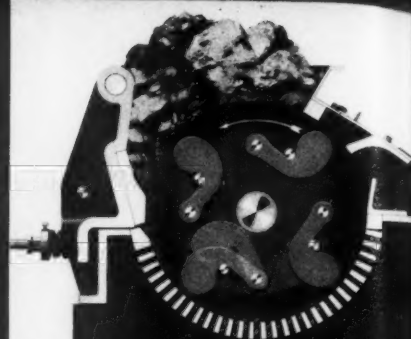
JEFFREY

also predominates

ABOVE GROUND

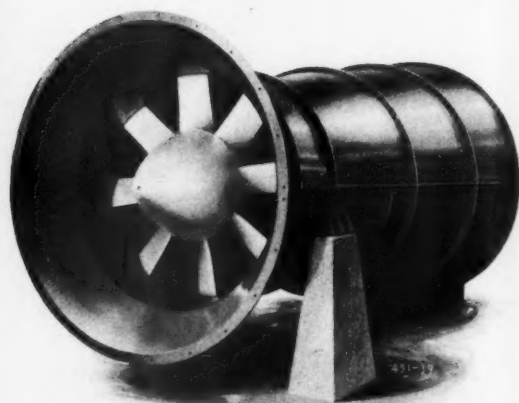
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Jeffrey crushers will convert slow-moving lump coal to stoker size in one reduction with a minimum of fines. They will enable you to send to market the sizes wanted, when they are wanted, and with remarkably little undersize loss. The Jeffrey 'Flextooth' crusher (patented) is illustrated.



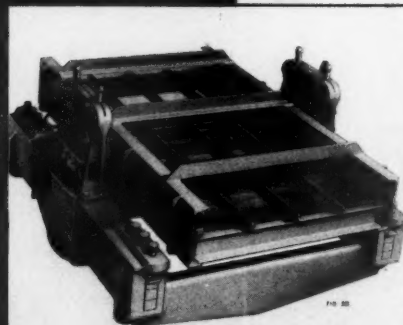
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The Jeffrey Aerodyne mine fan will maintain static efficiencies well over 80% when working over a comparatively wide range of duties . . . provides high pressures . . . saves power . . . and is reversible by changing direction of motor rotation. Also centrifugal type fans . . . and centrifugal or propeller blowers.



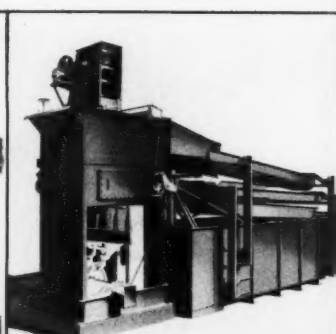
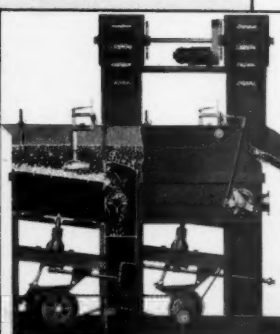
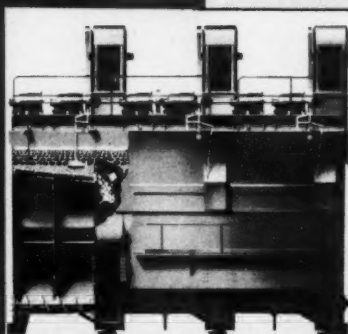
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Jeffrey-Traylor electric vibrating screens and feeders are constantly adjustable . . . have no moving mechanical parts . . . require no lubrication. The screens have a high 'through-screen' capacity on fine coal. The feeders are precision units for delivering coal to crushers, conveyors and cleaning systems. Catalog No. 650.



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R. L. IRELAND, JR.

President, The Hanna Coal Company

The Coal Division of the American Mining Congress, under the capable leadership of Mr. Ireland as Chairman is performing a large part in shaping the modern methods of coal mining.

18th COAL CONVENTION



King Coal Reviews His Realm

MUSIC HALL at Cincinnati will again be the center of interest and attraction for coal mining men from all parts of the country when the 18th Annual Convention and Exposition of the American Mining Congress gets under way on Monday, April 28, to last through Friday, May 2. Final preparations are being made which indicate that this year the Coal Show and Exposition, the discussions of new operating developments and economic problems, and the informal get-togethers for good will and fellowship have aroused greater interest and will be more widely attended than ever before.

This is the one opportunity of the year when alert operating men can get together, exchange and discuss new ideas, hear of the progress that has been made in other mines, meet old friends and new ones and see what the manufacturers have been doing to aid production, all in the atmosphere of cordiality and conviviality. With interest centered on the ability of the coal industry to produce to the full requirements for defense and continue indefinitely to do so with efficiency and safety, speakers have been selected who can discuss with the greatest authority the subjects to be presented. Discussion following each paper will give an opportunity to all present to contribute details of their experience. The manufacturers will exhibit thousands of pieces of equipment and supplies, a full cross-section of mechanical and equipment needs of the industry for these strenuous times. The usual informal luncheons and dinners will be held, and for the evening hours King Coal has arranged a series of entertainment features to provide fun and pleasure.

This is the meeting of the year that coal men cannot afford to miss, when at one place and one time all the various components of the industry are brought together to plan the pattern of the coal industry of the future. No one can yet foresee to what extent the coal mines of this country will be asked to contribute to its defense, but truly that contribution will be great, for "Coal is Defense." Problems of production are never ended because as soon as some are solved, others must be considered. From this meeting will be crystallized ideas to be carried back to mines all over the country, to insure greater, cheaper and safer production. No coal man can afford to miss it. Plan to be on hand at 9 o'clock Monday morning, April 28, at Music Hall for information, discussion and fellowship with your associates, your friends and your suppliers.

Interesting Program Featured

Under the chairmanship of George B. Harrington, President, Chicago, Wilmington and Franklin Coal Company, papers for a series of operating sessions that should bring out record-breaking crowds have been arranged. Committees from all major coal producing states and sections, under Mr. Harrington's leadership, have participated in drafting this program. Membership of the committees is shown on pages 34, 35 and 36.

The final and complete program giving the subjects of the papers, the authors and the session chairmen, with the times of presentation, may be found on page 37.

In keeping with the times, the opening session on Monday morning will feature Coal and Its Relation to National Defense. Although our coal mines have adequate capacity to meet all defense demands now in prospect, the maintenance of such capacity is directly dependent upon a continued supply of mining equipment and parts, upon the retention of trained mechanics and other skilled personnel, and upon adequate transportation. Without these requisites the whole machinery of coal mine production could not function. In the discussion of this problem, special consideration will be given to the necessity of adequate provision for mining equipment manufacturers in the determination of priorities upon materials such as alloy steels and other metals.

Mechanical loading and conveying methods will have a major share of attention at the operating sessions. The entire session Monday afternoon, April 28, will be devoted to various phases of this subject, as will also the afternoon session on Wednesday, April 30. Additional papers along these same lines will be interspersed in the programs at other times. Shuttle car haulage with mechanical loading, large transfer cars, and auxiliary face operation will be discussed on Monday. On Tuesday afternoon, an underground dragline conveyor system will be described. On Wednesday afternoon, conveyor mining in Alabama, requirements for successful duckbill mechanical loading, and economics of gathering belts with mechanized mining will receive attention. On Thursday morning, a vitally related subject, the effect of mechanization on managerial and supervisory problems, will be discussed.

Several papers will be devoted to safety. The session on Wednesday morning, April 30, will be devoted to papers on preparation methods, including the general economics of dewatering fine coal, the preparation of stoker coal, and cleaning of fine coal below stoker sizes. Power distribution for mechanical loaders and conveyors will be discussed, as will also the causes and prevention of mine roof deterioration, and other subjects such as vocational training and education for mine employes and the needs and uses of altimeter surveys in mine ventilation.

"Information—We Hope"

Every coal mining man has operating questions that he would like to have answered, and the Program Committee is arranging an entirely new feature. This will be a forum where such questions can be propounded to a panel of experts; perhaps they will be able to give the answers, but at least they can furnish some information—We Hope.

On Tuesday and Thursday mornings, this quiz will be presented at the regular convention sessions. Four or five well-known operators will be on the platform and will answer questions selected by the Information Committee. Advance tips

Program Committee

AND STATE CHAIRMEN

may be given to the experts, to assist considered and thoughtful replies, and a few oral questions from the audience, for extemporaneous answer, may be possible.

The object is not to "stump the experts"; the serious purpose is to develop discussion on pertinent problems in coal mining. Your question may be on loading, power, preparation, haulage, or on any other phase of operation.

Additional Meetings on Coal Stripping

In view of the importance of coal stripping operations in the industry today, two special sessions, on Tuesday afternoon and Wednesday afternoon, will be devoted to strip mine problems, concurrently with the other scheduled sessions on those days. The papers will discuss points of particular interest in coal stripping practice in Illinois, Indiana, Ohio and Kansas. Each morning session will start at 10 o'clock and the afternoon sessions at 2:15.

Committees Functioning

The Publicity Committee under Arthur C. Green, vice president, Goodman Manufacturing Company, has been functioning to let everyone in the coal industry know the time, the place and the tenor of the meetings. The Attendance Committee, under the chairmanship of J. B. Morrow, president, Pittsburgh Coal Company, is working closely with the Publicity Committee to bring out a maximum attendance of progressive mining men. The Floor Committee with D. H. Pape, president, Sheridan-Wyoming Coal Company as chairman, will be functioning at all sessions to keep the meetings running smoothly and carrying out the program according to schedule.

Miners' Exhibit is Growing

For the past two years a very popular feature of the Exposition has been a "Miners' Exhibit," comprising devices or operating kinks developed by coal company employees. These ideas and devices are those not yet commercially exploited by a manufacturing company. So popular has been this feature that it will be continued again this year, space being provided for the purpose in the exhibits of the Exposition. A Miners' Exhibit Committee with Jerome White, Monroe Coal Mining Company, Ebensburg, Pa., as chairman, has been actively working to stimulate interest and procure a wide and representative list of entries.

Exhibit space is allotted free of charge to those entrants whose applications are accepted. A judging committee will award prizes of \$10 each to the ten exhibits which are considered the most ingenious and which have the widest application. In addition, a copy of the 1940 Yearbook and a year's subscription to MINING CONGRESS JOURNAL will be presented to each exhibitor. Last year more than 50 devices were shown, and it is expected that even a greater number will be on display this year.

King Coal Bids His Subjects be Merry

After the serious work of each day is over, fun and entertainment will be on tap at the King Coal Club in the Netherland Plaza each evening of convention week. The entertain-

(Continued on page 40)

PENNSYLVANIA



T. R. JOHNS
Industrial Collieries Corp.

C. P. BRINTON
Barnes & Tucker Co.

J. M. CONNOR
West Penn Power Co.

JAMES M. COOK
Imperial Coal Corp.

FRANK B. DUNBAR
Mather Collieries

M. ALBERT EVANS
Koppers Coal Co.

F. S. FOLLANSBEE
Pittsburgh Coal Co.

ALTER E. HOUSMAN
H. C. Frick Coke Co.

L. O. LOUGEE
Geo. S. Batton & Co.

W. J. B. MAYO
Koppers Coal Co.

G. A. SHOEMAKER
Union Collieries Co.

E. A. SIEMON
Hillman Coal & Coke Co.

W. P. VANCE
Butler Consolidated Coal Co.

STRIP MINING



T. G. GEROW
Truax-Traer Coal Co.

K. R. BIXBY
Midland-Electric Coal Corp.

WILLIAM L. BURT
The Jefferson Co.

L. RUSSELL KELCE
The Hume-Sinclair Coal Mng. Co.

H. A. REID
United Electric Coal Companies

H. S. RICHARDS
Tecumseh Coal Co.

B. H. SCHULL
Binkley Mining Co.

J. W. WOOMER
Warner Collieries Co.

WEST CENTRAL



WM. R. CHEDSEY
Missouri School of Mines
and Metallurgy

THOS. C. CHEASLEY
Sinclair Coal Co.

A. E. MARRIOTT
Marriott-Reed Coal Co.

W. G. PARROTT
Sentry Coal Mining Co.

H. M. SHULER
Shuler Coal Co.

OHIO



C. W. JEFFERS
United States Coal Co.

S. W. BLAKSLEE
Powhatan Mining Co.

WM. P. CAYTON
Rail & River Co.

FRANK G. SMITH
Sunday Creek Coal Co.

VIRGINIA



CHAS. E. RALSTON
Benedict Coal Corp.

C. F. CONNELLY
Kemmerer Gem Coal Co.

J. P. HORNE
Raven Red Ash Coal Corp.

JOS. L. OSLER
Blackwood Coal & Coke Co.

J. D. ROGERS
Stonega Coke & Coal Co.

J. J. SELLERS
Virginia Iron, Coal & Coke Co.

J. B. TAGGART
Wise Coal & Coke Co.

ALABAMA



W. C. CHASE
Alabama By-Products Corp.

C. S. BLAIR
Black Diamond Coal Mng. Co.

C. E. BUTT
Alabama Power Co.

PERCY G. COWIN
Salmon & Cowin

BEN DAVIS
Gloss-Sheffield Steel & Iron Co.

MILTON H. FIES
DeBardeleben Coal Corp.

E. J. McCROSSIN
State Department of Safety

HAROLD McDERMOTT
Newcastle Coal Co.

HOWARD MOSS
Moss & McCormack Coal Co.

I. W. ROUZER
Alabama Mining Institute

ILLINOIS



CARL LEE
Peabody Coal Co.

C. V. BECK
Florida Coal Co.

GEO. F. CAMPBELL
Old Ben Coal Corp.

J. G. CRAWFORD
Valier Coal Co.

J. S. FORMAN
Mt. Olive & Staunton Coal Co.

C. T. HAYDEN
Sahara Coal Co.

G. S. JENKINS
Consolidated Coal Co.

FRED A. MILLER
Franklin County Coal Corp.

E. F. STEVENS
Union Colliery Co.

D. D. WILCOX
Superior Coal Co.

WM. P. YOUNG
Bell & Zoller Coal & Mng. Co.

WEST VIRGINIA



R. H. MORRIS
The Gauley Mountain Coal Co.

G. J. BEIDENMILLER
Glogora Coal Co.

D. J. CARROLL
Crab Orchard Improvement Co.

THOS. H. CLAGETT
Pocahontas Land Corp.

CHAS. C. DICKINSON, JR.
Dickinson Fuel Co.

H. A. McALLISTER
McCall Coal Co.

H. B. McNARY
New River Co.

WM. W. MILLER
Hatfield Campbell Creek Coal Co.

H. B. MORGAN
Red Parrot Coal Co.

CAREL ROBINSON
Consulting Engineer

ELLSWORTH H. SHRIVER
Raleigh Coal & Coke Co.

G. J. STOLLINGS
Mallory Coal Co.

T. C. WEEKS
Pemberton Coal & Coke Co.

ANDY F. WHITT
West Virginia Coal & Coke Corp.

INDIANA



A. K. HERT
Snow Hill Coal Corp.

D. W. HAYES
Clinton Coal Co.

W. D. INGLE, JR.
Ingle Coal Co.

ROCKY MOUNTAIN



T. E. JENKINS
National Fuel Co.

ALBERT GATELY
Republic Coal Co.

GEO. B. PRYDE
Union Pacific Coal Co.

W. J. THOMPSON
Colony Coal Co.

W. N. WETZEL
U. S. Fuel Co.

TENNESSEE



HUGH P. FINLEY
The Proctor Coal Co.

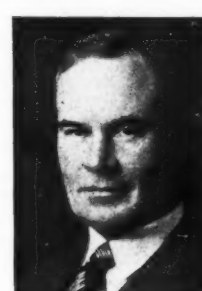
EARL B. CROSS
Pruden Coal & Coke Co.

STANLEE HAMPTON
Tennessee Consolidated Coal Co.

JOHN W. HOWE
Block Coal & Coke Co.

T. R. MITCHELL
Virginia & Jellico Coal Co.

KENTUCKY



J. E. BUTLER
Stearns Coal & Lumber Co.

H. S. ADKINS
Premier Coal Co.

W. J. BORRIES
Dawson Daylight Coal Co.

E. M. GATLIFF
Gatliiff Coal Co.

BRENT HART
Hart Coal Co.

A. R. MATTHEWS
Clover Splint Coal Co.

J. T. PARKER
Inland Steel Co.

Committees on Arrangements

FLOOR



D. H. PAPE
Sheridan-Wyoming Coal Co.

W. D. BRYSON
C. W. CONNOR
M. D. COOPER
H. S. HOMAN
G. S. JENKINS
JOE F. KLANER, JR.
STERLING S. LANIER, JR.
D. L. MCELROY
ROY RATLIFF
GEORGE STEVENS
J. W. WOOMEY

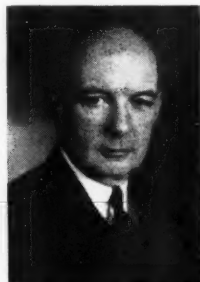
WELCOMING



B. H. SCHULL
Binkley Mining Co.

Assisted by a large corps of representative mining men and manufacturers' representatives

PUBLICITY



ARTHUR C. GREEN
Goodman Mfg. Co.

H. V. BROWN
M. R. BUDD
N. L. DAVIS
SYDNEY A. HALE
SYDNEY A. JASIK
W. C. JOHNSON
R. D. JORDAN
V. J. NOLAN
F. H. PINKERTON
W. C. RICHARDS
W. W. RODGERS
J. H. SANFORD
CLOYD M. SMITH

ATTENDANCE



J. B. MORROW
Pittsburgh Coal Co.

L. C. CAMPBELL
BRENT HART
C. T. HAYDEN
T. E. JOHNSON
A. E. MARRIOTT
H. F. McCULLOUGH

MINER'S EXHIBIT COMMITTEE



JEROME C. WHITE
Monroe Coal Mining Co.

R. L. DAMS
TED BERGRUN
C. E. BUTT
C. W. CONNOR, JR.
E. A. COTTINGHAM
WM. CUNNINGHAM
E. D. GALL
C. W. GIBBS
G. E. HOOVER
WM. G. HOWE
G. A. KNOX
A. E. LONG
S. F. MCGURK
W. H. STEEN
J. B. TAGGART

ENTERTAINMENT



J. H. FULFORD
Jeffrey Mfg. Co.

H. B. ALLISON
DONALD J. BAKER
WM. BEURY
S. W. BLAKSLIE
W. J. BORRIES
J. F. CALLAHAN
M. L. COULTER
L. F. CROUSE
C. P. DANIEL
IRVIN DAVIS
T. M. GOOGIN
JOS. GREEN
GEO. C. HOLTON
SHELLY G. HUGHES
HERBERT B. HUSBAND
A. L. JOHNSTON
F. W. KIRBY
R. M. LAMBIE
HARRY LAVIERS
GORDON MACVEAN
RAY MIDDLETON
FRED A. MILLER
L. C. MOSLEY
R. J. OLDHAM
J. P. PALMER
DON B. POTTER
A. J. RUFFINI
N. C. SHAVER
WM. SIMPSON
FRANK G. SMITH
W. H. STEWART
VAN B. STITH
A. WALDMAN
DON A. WEBER

SPECIAL COAL STRIPPING SESSIONS

TUESDAY, 2:15 P.M.

Chairman: HUGH B. LEE
Vice Pres. & General Manager,
Maumee Collieries Co.

Exploration for Coal Stripping

WALTER B. ROE
Geol., Truax-Traer Coal Co.

Overburden Preparation—Methods and Equipment

CARL E. WALKER
Ayrshire-Patoka Collieries Corp.

Planning and Working Smaller Strip Mine Operations

F. R. PHILLIPPI
Vice Pres. & Treas., The Dye Coal Co.

WEDNESDAY, 2:15 P.M.

Chairman: WILLIAM L. BURT
Vice Pres., The Jefferson Company

Hydraulic Application to Coal Stripping

R. E. HENDERSON
Gen. Supt., Pyramid Coal Corp.

Open Pit Coal Mine Haulage

ERIC E. LAURELL
Supt., United Electric Coal Cos.

Strip Mine Maintenance

GEO. E. NETTELS
Gen. Supt., Pittsburg & Midway Coal Mng. Co.

PROGRAM

MEET THE SPEAKERS ON PAGE 40

Monday, April 28

MORNING SESSION, 10:00 A.M.

Session Chairman

GEORGE F. CAMPBELL
Vice Pres., Old Ben Coal Corp.

Opening Addresses

GEORGE B. HARRINGTON
Pres., Chicago, Wilmington & Franklin
Coal Co., National Chairman, Program
Committee

ARTHUR S. KNOIZEN
Vice Pres., Joy Manufacturing Co.,
Chairman, Manufacturers Division,
American Mining Congress

R. L. IRELAND, JR.
Pres., Hanna Coal Co., Chairman, Coal
Division, American Mining Congress

Coal and National Defense

L. W. HOUSEHOLDER
Vice Pres., Rochester & Pittsburgh Coal
Co., Indiana, Pa.

Certain Aspects of Coal Mine Safety

EUGENE MCAULIFFE
Pres., Union Pacific Coal Co., Omaha,
Nebr.

AFTERNOON SESSION, 2:15 P.M.

Session Chairman

JOHN T. SYDNOR
Vice Pres., West Virginia Coal and Coke Corp.

Shuttle Car Haulage with Mechanical Loading

S. L. ANDERSON
Supt., Peabody Coal Co., Harrisburg, Ill.

Large Transfer Cars, Transfer Station and Track Haulage for Mechanical Loading

DAVID W. JONES
Gen. Supt., Princeton Mining Co.,
Princeton, Ind.

Auxiliary Face Operations

A. E. DUCKWALL
Chf. Engr., U. S. Coal & Coke Co.,
Gary, W. Va.

Tuesday, April 29

MORNING SESSION, 10.00 A.M.

Session Chairman

J. L. SULLIVAN
General Supt., H. C. Frick Coke Co.

Recommended Practice for Mechanical and Electrical Maintenance

FRANK EUBANKS
Supt. of Maintenance, Old Ben Coal
Corp., West Frankfort, Ill.

**Lubrication for Mining Equipment—
Selection, Use and Handling**

HAROLD S. LOWRY
Chf. Engr., Snow Hill Coal Corp., Terre
Haute, Ind.

"Information—We Hope"

A new feature, consisting of a panel of
several well known operating men who
will answer questions on mining
problems.

AFTERNOON SESSION, 2.15 P.M.

**Power Distribution for Mechanical
Loaders and Conveyors**

R. L. KINGSLAND
Elec. & Maintenance Engr., Consolida-
tion Coal Co., Fairmont, W. Va.

Underground Drag Line Conveyor

A. FRED PHELPS
Supt., Pardee & Curtin Lumber Co.,
Webster Springs, W. Va.

Safety with Mechanical Mining

R. H. NICHOLAS
Chf. Inspector, Pittsburgh Coal Co.,
Library, Pa.

Wednesday, April 30

MORNING SESSION, 10.00 A.M.

Session Chairman

MORONI HEINER
Pres., Utah Fuel Co.

**General Economics of Dewatering
Fine Coal**

C. J. POTTER
Mgr. of Prep., Rochester & Pittsburgh
Coal Co., Indiana, Pa.

**Preparation of Stoker Coals—Economic
Factors Involved**

JACK H. PRICE
Coal Sales Mgr., Stearns Coal & Lumber
Co., Stearns, Ky.

Cleaning Fine Coal Below Stoker Sizes

VIRGIL CARGILE
Gen. Supt., Tennessee Products Corp.,
Whitwell, Tenn.

AFTERNOON SESSION, 2.15 P.M.

Session Chairman

E. R. PRICE
General Supt., Inland Steel Co.

Conveyor Mining in Alabama

F. J. IMMLER
Asst. to Chf. Engr., Alabama By-Prod-
ucts Corp., Birmingham, Ala.

**Requirements for Successful Duckbill
Mechanical Loading**

S. W. BLAKSLEE
Gen. Mgr., Powhatan Mining Co., Pow-
hatan Point, Ohio

**Economics of Gathering Belts with
Mechanized Mining**

CAREL ROBINSON
Cons. Engr., Charleston, W. Va.

Thursday, May 1

MORNING SESSION, 10.00 A.M.

Session Chairman

JOHN D. ROGERS
Vice Pres., Stonega Coal & Coke Co.

**The Effect of Mechanization on Managerial
and Supervisory Problems**

JAMES HYSLOP
Gen. Mgr., Hanna Coal Co., St. Clairs-
ville, Ohio

**Vocational Training and Education for
Mine Employees**

T. J. THOMAS
Pres., Valier Coal Co., Chicago, Ill.

"Information—We Hope"

A new feature, consisting of a panel of
several well known operating men who
will answer questions on mining
problems.

AFTERNOON SESSION, 2.15 P.M.

Session Chairman

L. E. YOUNG
Con. Engineer

**Causes and Prevention of Mine Roof
Deterioration**

H. B. McNARY
Cons. Engr., The New River Co., Mt.
Hope, W. Va.

St. Lawrence Waterway and Power Project

B. D. TALLAMY
Chief Engineer, Niagara Frontier Plan-
ning Board.

**Need and Use of Altimeter Surveys in
Mine Ventilation**

STEPHEN KRICKOVIC
Gen. Mine Insp., Koppers Coal Co.,
Pittsburgh, Pa.



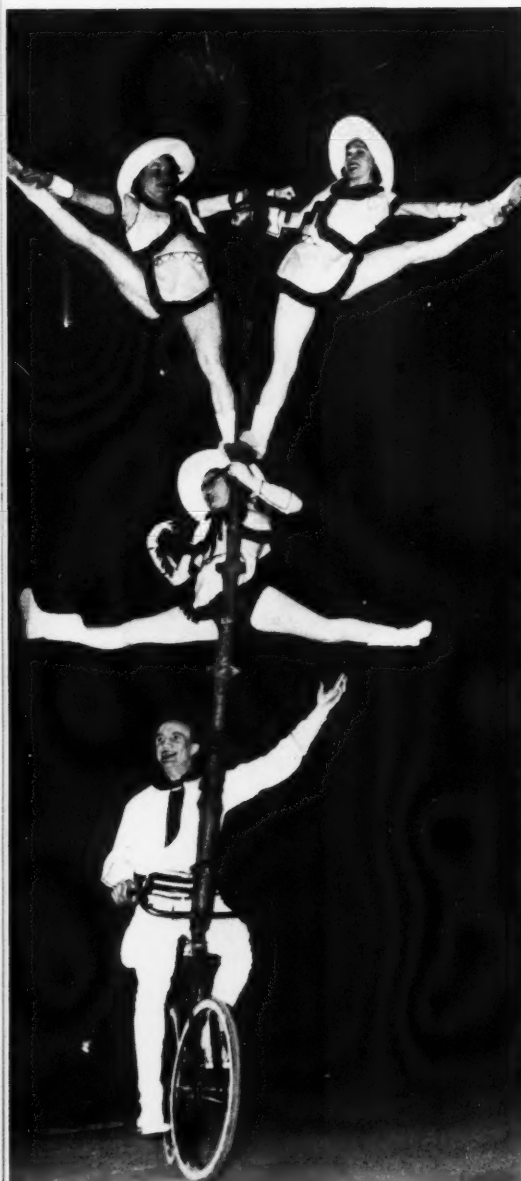
THE SKATING CARTERS
A flashing act on skates



THE THREE WALTONS
Pantomime and Comedy



KNIGHT SISTERS
Stars of George White's Scandals



THE FOUR SIDNEYS
Unicycle and Balancing Feats
From Ringling Bros., Barnum and Bailey Circus



JAY AND LEW SEILA
An Unusual Act



DELL O'DELL
Mistress of Ceremonies



JANETTE HACKETT REVUE
A Complete and Attractive Ensemble

COAL CLUB CAPERS

King Coal Club at the Netherland Plaza Hotel is the "official" entertainment spot. Moderately priced dinner service begins at 6:00 P. M. nightly, except Thursday. Two splendid floor shows each night, a well known dance orchestra and the "convention crowd" guarantees that you'll have the time of your life!

MONDAY—KING COAL FROLICS

A start-off-the-week-right party featuring the Janette Hackett revue of beautiful girls, the Singing Texans, Skating Carters and other headliners, with Dell O'Dell emceeing and presenting bits of magic. Shows at 8:30 and 10:30.

TUESDAY—FIGHT NIGHT

Another whirlwind card of ten bouts between amateur boxers from the coal fields—featuring several winners from last year. Fights at 10 o'clock, with two bang-up floor shows—8:30 and 12:30.

WEDNESDAY—MINERS' JAMBOREE

A fun-fest you'll long remember! June Boyd and her xylophone, the sensational Juvelys—balancing artists, the Texans, new routines by the Janette Hackett girls, and top-notch comedy features—will make the 8:30 and 10:30 shows highlights of a night of fun.

THURSDAY—ANNUAL BANQUET

The famous coal miners' "speechless" dinner with L. Ebersole Gaines, President, New River Company, presiding as Toastmaster and presenting well known industry leaders. Stellar entertainment will feature a return engagement of Ilomay Bailey and Lee Sims—the stars who captivated our 1938 banquet crowd.

FOR THE LADIES

Special day-time entertainment features will assure all the ladies a full calendar. Of course they're all expected to attend all the regular evening functions.



BOB FULLER'S SINGING TEXANS
Harmony and Song



Putting Ferdinand the Bull and Pansy
the Horse Through Their Paces



SIMS AND BAILEY
Stars of Radio



THE BOXING TOURNEY
Fast and Furious Action



THREE SOPHISTICATED LADIES

— Meet the Speakers —

(See main program on page 37 and strip program on page 36 for subject and time.)

S. L. ANDERSON.—16 years with the Peabody Coal Co. as construction boss, face boss, mine manager and superintendent.

S. W. BLAKSLIE.—Started his experience in conveyor mining as superintendent for the Pennsylvania Coal and Coke Co. more than 15 years ago. He was subsequently production manager for the Philadelphia and Reading Coal and Iron Company, and for the last two years has been in his present position.

VIRGIL CARGILE.—Mining since 1908, in Alabama and Tennessee many years as chief electrician and superintendent, has been general superintendent, Whitwell Division, Tennessee Products Corp. since 1938.

A. E. DUCKWALL.—Started with H. C. Frick Co. 25 years ago in construction department. Then division engineer, Kentucky, U. S. Coal and Coke, and now is chief engineer for the same company.

FRANK EUBANKS.—Has spent 23 years in the maintenance department of the Old Ben Coal Corporation, and is thoroughly experienced with the maintenance requirements for mechanical loading.

R. E. HENDERSON.—General superintendent of Pyramid and Bobolink mines of Pyramid Coal Corp. Started as clerk, then pit foreman, and mine superintendent before promotion to present position in 1940.

L. W. HOUSEHOLDER.—Has been with his present company for about 20 years, and under his direction, this company has made a number of valuable contributions to the development of modern coal mining.

JAMES HYSLOP.—Came to his present position about a year ago; formerly he was in charge of the Walter Bledsoe & Company operations in Indiana, and has long been known as an exponent of mechanical mining.

F. J. IMMLER.—Long record as engineer, division engineer and superintendent coal mines and iron mines, principally in Alabama. In present position past four years.

DAVID W. JONES.—After 12 years in mining in the west, was electrical engineer and superintendent for 14 years with Valier Coal. General superintendent, Princeton Mining Co., since 1937.

R. L. KINGSLAND.—In his present position with the Consolidation Coal Company for about 25 years, and has had a wide experience in the application of electrical power for hand and mechanical mining.

STEPHEN KRICKOVIC.—Engineer for 12 years on production studies and analyses, and since 1939, general mine inspector for Koppers Coal with special attention to ventilation.

ERIC E. LAURELL.—Engineer in Missouri, Nevada and Mexico, followed by 10 years' experience with companies in South America. With United Electric Coal Cos. since 1938.

HAROLD S. LOWRY.—Educated in Indiana and early experience in mining there, later chief electrician Snowhill Corp., on mechanization of mines, and to present position.

EUGENE McAULIFFE.—Is one of the pioneers of mechanized coal mining, and was among the first successfully to operate conveyors and mechanical loaders. Under his direction, his company has made an outstanding record in safety and accident reduction.

H. B. McNARY.—Wide experience as a mining engineer—from Canada to Oklahoma—and for the past several years has been engaged in the development of modern mining practices with his present company.

GEORGE E. NETTELS.—20 years with Pittsburg and Midway Coal Mining Co. as mining engineer and general superintendent, the latter since 1925.

R. H. NICHOLAS.—Following early years of experience in various capacities to superintendent, was mine inspector, chief inspector and chief of inspection and safety department for Pittsburgh Coal Co.

A. FRED PHELPS.—Began his mining experience more than 30 years ago as a manufacturer. For the past eight years he has been in his present position, and his early training has led to the development and application of new ideas in the industry.

F. R. PHILLIPPI.—Nine years on engineer corps and engineer Pennsylvania and Ohio; then chief engineer and general manager stripping operations, Ohio. In present position four years.

C. J. POTTER.—Experience northern West Virginia, then with marketing branch Bituminous Coal Division. In present position since 1940.

JACK H. PRICE.—Ten years in coal sales, then eight years with Stearns Company, same capacity, last three as sales manager.

CAREL ROBINSON.—Has had a wide experience as an engineer in this country and abroad. For the past few years he has specialized on conveyor mining and mechanical loading; formerly as general manager of the Kelleys Creek Colliery Company, and more recently as a consultant.

WALTER B. ROE.—Graduate and post-graduate in geology, Northwestern University, followed by three years, Illinois Geological Survey. In present position since 1934.

B. D. TALLAMY.—Civil engineer in active practice since 1929 dealing with hydroelectric structures such as are involved in the St. Lawrence Seaway. Has made a close study of the proposed project.

T. J. THOMAS.—In addition to being one of the pioneers in mechanical loading in Illinois, is well known for the active part which he has taken toward promoting safety and improving operating methods.

CARL E. WALKER.—18 years, from engineer, underground, through various positions in Ohio, Pennsylvania and Indiana to superintendent strip mines. Eight years in charge overburden preparation, present position.

(Continued from page 34)

ment Committee under Chairman J. H. Fulford, general manager of sales, Jeffrey Manufacturing Company, will present many "enlightening" features, as an outstanding contribution to the success of the meeting. Dinner will be served at the "Club" on Monday, Tuesday and Wednesday evenings; excellent food will be available at a moderate price, there will be music for dancing and two floor shows each evening made up of stellar productions. The shows will be at 8:30 and 10:30 on Monday and Wednesday evenings. On Tuesday evening, following the dinner hour, a boxing tournament similar to that of last year will be held in the Hall of Mirrors at 10 p. m., with floor shows in the King Coal Club before and after the bouts.

Headlining the banquet entertainment on Thursday evening will be those radio favorites, Lee Sims and Ilomay Bailey in "Musical Designs and Patterns." Lee Sims is widely known for his "Piano Moods" program over the NBC network and Ilomay Bailey is known as "The Personality Girl of the Air." Two of the most popular guest stars ever to appear at a Mining Congress banquet, their performance for the coal men in 1938 was so well received that a general demand has resulted in this return engagement. Another attraction, appearing throughout the week will be the Janette Hackett Revue, a line of choristers and entertainers in dance numbers and revues. Other well known acts of stage and radio fame will contribute to a fast-moving and different floor show each night of the week.

The boxing tourney on Tuesday evening brings back to the square ring in the Hall of Mirrors of the Netherland Plaza, outstanding A. A. U. fighters including many Golden Gloves contestants or winners. There will be ten bouts altogether,

eight consisting of three rounds at two minutes each, and two fights of five two-minute rounds. All classes from flyweights to heavyweights will be included. Four men will have return engagements for the outstanding performances they gave last year. Marion Klingensmith, the middleweight champion of champions last year is one of those who will be back. The winner of each bout will be presented with a wrist watch, and the champion of champions will receive a special prize. Every contestant will be presented with a flannel robe, silk boxing trunks and shoes—win, lose or draw.

On Thursday evening will be held the annual banquet as usual. This banquet, a "speechless" occasion, climaxes the week's festivities with a dinner to be long remembered and entertainment of the highest caliber. Toastmaster will be L. Ebersole Gaines, president, The New River Company, Mt. Hope, West Virginia, and president of the West Virginia Coal Association.

Ladies to be Entertained



L. Ebersole Gaines

Plans are also under way for the entertainment of the ladies who will visit the convention with their husbands. There will be get-together luncheons, afternoon parties and sightseeing tours for all, and the ladies will participate in the evening functions at the King Coal Club and the annual banquet. A top-notch orchestra will furnish music for dancing on these occasions.

EXPOSITION PREVIEW

—A PARADE FOR DEFENSE

A CLOSE-PACKED parade a mile long—a parade of machinery, equipment, accessories and aids to quicker, more efficient, safer and cheaper production, will line the rooms of Music Hall in Cincinnati, April 28 to May 2, for the information and instruction of coal mining men from all parts of the country. 35,000 square feet of ideajammed exhibits will greet the multitude of coal men who come to Cincinnati to see what has been developed during the past year, with which they can obtain greater production at less cost with safety.

This year, and after, a torrent of coal must be kept flowing to the coke-ovens, to the blast furnaces, to manufacturing plants, to railroads, to office buildings where the lights are burning late, and to innumerable homes, if this country is to be kept safe from invasion. The manufacturers have gone to much time and effort to see that this mile of exhibits contains all that is new and progressive in coal mining. The exposition is the one time in the year when you can find in one place all the new ideas in production aids, and judge them side by side with that which has proved its utility and dependability through years of service.

Contrast the mines of today with those of thirty or forty years ago. Progress in methods, equipment and results has been great in total, made by a gradual year-to-year advance. Dependence is placed less and less on animal strength and more on the tireless working of efficient machines. Operating men see the needs to carry this program on, and the manufacturers work the ideas into the concrete form of the equipment necessary. At the Exposition all

elements are brought together—operating men and officials, manufacturers, and the equipment they produce, to the end that coal mining will continue to advance in production, efficiency and safety. From the Exposition these ideas in concrete form are carried back to the mines of the country, to see where and how they will fit individual operations, opening up bottlenecks in production, smoothing the flow of coal from the face and insuring better working conditions.

Every man that comes to the convention is urged to make a careful inspection of the displays, to gather ideas that can be put to work on the job back home. Experts will be on hand to inform and advise. There is inspiration in the Exposition for everyone who attends.

The Exposition is sponsored by the Manufacturers Division of the American Mining Congress, which this year, under the chairmanship of A. S. Knoizen, vice president of the Joy Manufacturing Company, is aiding in the preparation of a Coal Show on a scale to meet the needs of the times. Every exhibit is worth while. Don't miss it, and ask all the questions you want.

That you may be informed in advance, the following pages give a brief preview of what you will find at the Exposition. Check the points you especially want to see and allow plenty of time to see them all. Numerous other features are included, too numerous to be given in the following brief outline.

For literature or further information concerning any items, write to the manufacturers or to the MINING CONGRESS JOURNAL.

• AHLBERG BEARING COMPANY

Presents many different types of ball and roller bearings, such as used in coal mining machinery; a complete ball and roller bearing service for coal mine machinery maintenance. Included will be the famous "Ahlberg Ground" ball bearings.

Are also exhibiting the famous "Croft" ball and roller bearing cleaner units and the Croft ball and roller bearing grease packing units. *In charge*—M. G. McGregor.

• AIR REDUCTION SALES COMPANY

Airco oxygen and acetylene, Airco welding and cutting apparatus and supplies, National carbide and National carbide lights, Wilson electric arc welding machine and electrodes, Stooddy hardfacing materials and specimens of mining machinery parts that have been fabricated or welded by either the oxyacetylene or electric arc welding process will be displayed. There will be specimens of flame hardened pieces of equipment, which will be of interest to the mine officials. Will also be of interest to the coal mining men. *In charge*—H. F. Henriques and others.

• ALLIS-CHALMERS MANUFACTURING CO.

In addition to the well-known horizontal Low-Head screen, the company will show, for the first time, their new Ripl-Flo Screen already finding wide acceptance by coal operators. This screen will be in operation, as will also the company's new all-in-one Electrifugal Motor Pump—the latest design in the company's SS-Unit pump line. Also, the company will display a variety of motors and Texrope multiple V-belt drives for both constant and variable speed applications. *In charge*—W. G. May.

• ALLIS CO., THE LOUIS. No description received.

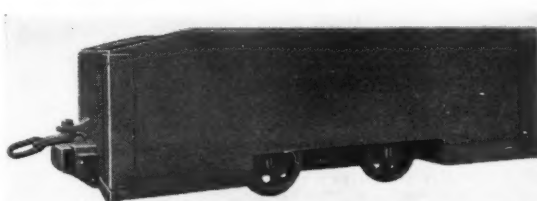
• AMERICAN BRATTICE CLOTH CORP.

The American Brattice Corporation's new demountable coupling, which reduces air leakage at the joints to a minimum and permits rapid installation; a short line of Mine Vent Tubing, showing the different grades manufactured, and different types of suspension—all connected to a 12 in. diameter blower fan. *In charge*—Blaine Mikesell.

• AMERICAN BRIDGE COMPANY. See United States Steel Corp.

• AMERICAN CAR AND FOUNDRY COMPANY

Exhibit will be made up of a modern mine car and will also show mine car wheels, bumpers and end sills and sections of each showing the construction.



• **AMERICAN CHAIN & CABLE COMPANY, INC.**
American Cable and Hazard Wire Rope Divisions

Various grades and constructions of wire ropes will be exhibited. Featured will be the Tru-Lay and Lay-Set Preformed Wire Ropes. The advantages of Preformed wire rope over ordinary ropes dramatically show in the background of the exhibit.

In Tru-Lay and Lay-Set wire ropes every wire and strand is preformed



into the true helical shape they assume in the finished rope, thus removing all internal stress. Preforming provides increased flexibility in the rope and increases resistance to fatigue in bending around sheaves and drums, resulting in longer life.

Visitors to the show are invited to consult with the company representatives on any of their wire rope problems. *In charge*—B. H. Todd, and others.

• **AMERICAN CYANAMID & CHEMICAL CORPORATION**

The Explosives Department of the company will have an exhibit to convey a message on the dependability and safety of American Electric Blasting Caps as a blasting agent. *In charge*—C. S. Simonsen.

• **AMERICAN STEEL AND WIRE COMPANY.** See United States Steel Corporation.

• **ANACONDA WIRE & CABLE COMPANY**

Mine Wiring for Mechanization will be the theme of the company's exhibit. Included will be miniature reproductions of typical, as well as up to the minute, installations of Mine Cable.

One of the features will be a streamlined, two conductor parallel, mining machine cable, designed for easy winding and unwinding and to occupy a minimum of reel space.

Application of wires and cables for mine mechanization, lighting, telephoning and blasting will also be shown, along with the latest thing in Mine Suspension Units.

Emphasis will be placed on fine qualities in cables, as well as their adequacy. *In charge*—M. J. McCarthy, Jr.

• **ATLAS POWDER COMPANY**

Exhibit will emphasize the savings of safety—the story of uninterrupted production and of the profits to be made through the use of safer blasting materials and modern methods.

Atlas Manasite detonators, first announced at the 1938 Coal Show, have passed another milestone of acceptance—more than 100,000,000 have been used. Photographs of tests and examples of actual use will be featured at the Atlas booth.

Atlas will also demonstrate the money saving possibilities of closely suiting the explosive to the coal—possible through the wide available range of Coalites, Gelcoalites and Apcol permissible explosives. *In charge*—John L. Romig.

• **BARBER-GREENE COMPANY**

Will show photographs and drawings of various conveying installations for underground conveying and surface storage. The pictures will include set-ups for storing tremendous quantities of slack and for reclaiming from these piles to cars. Special Barber-Greene underground conveyors, both belt and drag types, will be included. *In charge*—J. F. Janda and E. D. Stearns.

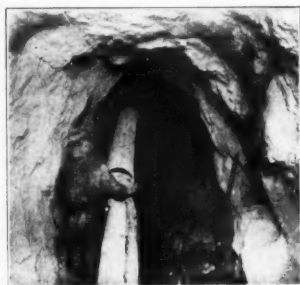
• **BEMIS BRO. BAG CO.**

Will exhibit Flexipipe—flexible tubing for mine and tunnel ventilation.

FLEXIPIPE is a collapsible duct tubing in diameters from 8" to 36" and in lengths from 25 ft. to 100 ft.

A special feature of the exhibit will be samples showing the rope seam method of suspension and sliding suspension clamp.

Balloons and other articles will be given to visitors. *In charge*—D. W. Marshall.



• **BETHLEHEM STEEL COMPANY**

Showing of a new industrial moving picture, "Sinews of Steel," dealing with the manufacture and use of wire rope will be one of the main attractions at this company's exhibit. The main part of this picture deals with the various manufacturing processes at the Williamsport, Pa., plant, where all Bethlehem wire rope is made. Sections are also devoted to the production of steel for wire rope, and to important applications of the finished rope.

Products on display include a complete room switch with target stand, malleable iron heel blocks, spring rod and switch stand; steel mine ties and AR-Moored ties; forged mine car wheels on a through axle, mounted on 40 lb. A.S. rails on steel ties equipped with guard rail chairs and guard rails; coupling links and pins. Transparencies will be on display showing abrasion resisting steel plates, hollow drill steel, and various applications of Mayari R high-strength, corrosion-resisting steel in mining equipment. *In charge*—R. L. Gillespie.

• **BIXBY-ZIMMER ENGINEERING CO.**

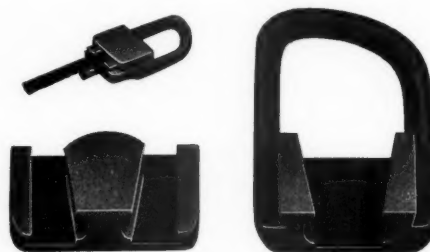
Display will consist of screens manufactured from stainless steel and bronze materials, after the fashion of round wires having been welded, via electric fusion arc, to round supporting bars. The screens will be displayed in several sizes, with various diameters of round wires and with a variety of size openings. Some screens will be shown with fabricated framings to accommodate their accessible installation into standard types of stationary, shaker and vibrating equipment.

The displayed screens will be manufactured for use, primarily, in the handling of coal in several of the preparation processes to which it is subjected, namely: dewatering, sizing and drying.

Displays and available informative data will tend to show that the screens are custom-built to meet the particular performance required of individual and independent preparation problems. *In charge*—Walter H. Zimmer.

• **BOWDIL COMPANY, THE**

Will show at Cincinnati, chains, cutter bars, secondary cutting bits, drilling equipment, choke arc switches and rope clamps. The major feature of the exhibit will be a revolutionary designed cutter bar, chain and



bit involving increased strength and a drop forged chain without side straps or rivets. Only one minute is required to couple or uncouple the chain.

The new Bowdil rope socket, to be displayed, can be installed in two minutes—without tools. *In charge*—C. L. Bowman, A. J. Leach.

• **BRODERICK & BASCOM ROPE CO.**

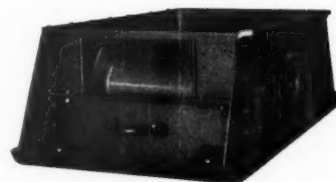
The main feature will be miniature wire rope making machines. One of these is a nineteen wire stranding machine which makes nine wires and actually forms them into an individual strand.

The other machine is a miniature closer which takes six individual strands and lays them up around a hemp center into a six-strand wire rope. While the diameter of the finished product is only about 1/16 of an inch, the process is identical to manufacture of an actual coal mine rope. The machines are similar in all essentials to factory machines, although many of the refinements of the large machines were necessarily omitted; but the processes of manufacture are very clearly indicated.

• **BROWN-FAYRO COMPANY, THE**

Will have on display the "Brownie" Model HKM Conveyor Car Spotting Hoist. A low seam type, only 20 in. high, rated 6,000 lbs. rope pull; an entirely new design and the result of over thirteen years active experience in this field.

The "Brownie" Model HGD Conveyor Auxiliary Hoist used for dragging conveyor sections and supplies up to the working point. A portable, easily handled hoist that will save money in moving material.



The "Brownie" BC Tubing Blower. A high capacity electric blower for auxiliary ventilation, driven by a totally enclosed, nonoverloading motor.

The Austin-Brownie Gathering Pump. A totally enclosed, oil bath lubricated piston type pump, size 6 x 6, with Duraloy chrome iron water end. Rated 100 G. P. M. against heads up to 200 feet.

The "Brownie" Rerailers for use on 20 to 60 lb. rails. *In charge*—Fred M. Davis.

• **BUCYRUS ERIE CO.** No description received.

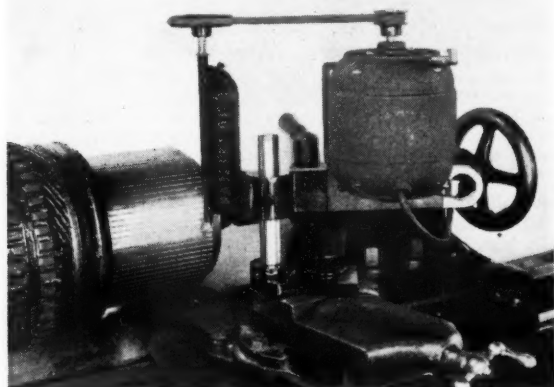
• **CARDOX CORPORATION**

Will feature the principal equipment employed in the company's non-explosive method of dislodging coal at the working face. A Cardox low pressure liquid CO₂ storage tank, a charging plant and discharge tubes in a complete range of sizes will be on display.

• **CARNEGIE ILLINOIS STEEL CORP.** See United States Steel Corporation.

• **CENTRAL ELECTRIC REPAIR COMPANY, INC.**

Will exhibit three pieces of equipment as follows: A new precision like, lathe type commutator undercutting tool which mounts in the tool post position on the lathe carriage, assuring uniform depth with all mica removed from sides of bars. Will accurately follow mica slot where commutator is not exactly parallel with shaft, and will remove copper that



is dragged over where the former undercut has not been entirely removed. Also a portable series field coil tester for instantly locating short circuited coils, a very essential unit tester for mining and industrial plants, and a chute or suspended type tramp-iron magnet for removing refuse iron and steel from coal, etc. *In charge*—E. R. Manley.

• **CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.**

Will show their "Scene-in-Action" sign as well as display valuable literature covering the machines offered for the use of the coal cleaning plants. Will also have a mobile demonstrating truck with which a lot of tests have been conducted all over the country. This unit will be parked in the exhibit spaces and a man will be on hand who will make tests every several hours during the entire convention, which will show how the machine operates by drying either coal or slurry. *In charge*—F. E. Finch.

• **CHICAGO PNEUMATIC TOOL COMPANY**

Will feature for the first time a new Self-Propelled Truck Mounted Coal Drill Unit equipped with Tractor Treads and two Drill Arms operated by hydraulic pressure. These arms can be furnished of proper length to take care of the height of seam and width of room. These mobile units are available for storage battery or cable-reel operation, with Tractor Tread as exhibited, or with pneumatic rubber tires for trackless mining systems, or flanged wheels for track operation.

Also displayed will be Post-Mounted and Hand-Held Coal Drills of Permissible and Open Types, representative of their complete line of 14 models, as well as portable Electric and Pneumatic Drills, Nut Runners, Grinders, Chipping and Riveting Hammers, etc., for repair and maintenance of top and underground equipment, mine cars, locomotives, etc. *In charge*—L. J. Walker.

• **CINCINNATI MINE MACHINERY CO.** No description received.

• **CITIES SERVICE OIL COMPANY**

Will exhibit "Sealed Lubrication" and an Air Prover, plus special lubricants particularly suited for the lubrication of mining machinery.

"Sealed Lubrication" consists of a grease-filled, sealed cartridge, which, together with a grease gun of special design, puts the grease where you want it, surely, quickly, and easily without exposing the grease to contamination in the process. It is new, simple and effective.

The Air Prover is also a new device, developed by one of the company's laboratories for measuring carbon monoxide and oxygen deficiency in mine atmosphere. *In charge*—B. B. Bears.

• **COFFING HOIST COMPANY**

Will exhibit products manufactured by the company. Various models of the well-known "Safety-Pull" ratchet lever hoist, long a favorite with



mine maintenance and construction crews, will be on display. The new "Quik-Lift" electric hoist and two types of spur gear chain hoists will also be shown. *In charge*—Mike Crowder and F. W. Coffing.

• **DEISTER CONCENTRATOR COMPANY, THE**

The company will present practically its full line of Conenco Products including exhibit units devoted to its widely accepted Diagonal-Deck Coal Washing Tables, the Tri-Vibe equipped Leahy Screen, Conenco Spray Nozzles, and its newest Conenco product, a feed distributing device that will be exhibited to industry for the first time.

The Super-Duty Coal Washing Table introduced with spontaneous reception at the 1940 show will be exhibited in its latest improved type in one-fourth commercial size and in operation.

Highlighting the exhibit is the new heavy duty, type CRF, Conenco Revolving Feed Distributor.

The differential vibration characteristics of Tri-Vibe equipped Leahy screening equipment will be analyzed for visitors at the booth by a unique vibration graph recording machine operated by an actual Leahy vibrator model.

Conenco Spray Nozzles, that assemble without tapping of spray line and deliver a flat blade or sheet flow discharge for economical and highly practical application, will be exhibited in two types—for average and heavy duty washing operations. *In charge*—Don A. Weber.



• **DEISTER MACHINE COMPANY, INC.**

Will have on exhibit a Double Deck 4 x 8 ft. Deister Plat-O Vibrating Screen in operation. Will also have on display large-size photographs and other interesting data on the Deister Plat-O Coal Washing Table. *In charge*—I. F. Deister.

• **DIFFERENTIAL STEEL CAR COMPANY**

Will show an eight-wheel axless truck mine car of eleven tons capacity. Also will have a photographic display of locomotives, larries and mine cars. *In charge*—Shelly Hughes.

• **DUFF-NORTON MANUFACTURING COMPANY, THE**

Newly improved Duff-Norton Mine Roof Jacks will be featured at the exhibit of the company. The new Mine Roof Jacks have greater capacity and rigidity to meet the requirements of modern mining practice. The tube, or standard of the jack has been made larger, with thicker, heavier walls, and the jack has been enlarged and strengthened throughout to insure better service and greater safety where hazardous roof conditions exist. Quick, easy spotting under all conditions is claimed for this jack.

The Duff-Norton Mine Roof Jack is available with several types of handles and heads as required by mining practice.

Handles include the familiar slide type, which provides extra leverage,



and is handy in close quarters; the drop handle which is similar to the slide handle, except that it folds down beside the tube when not in use; the wing nut type, preferred by many because it gives a firm two-hand grip. Heads are made in four styles, including types to accommodate 4-in. or 6-in. H-beams, round or square timbers, as well as the ball and socket top for application against roof itself. The variety of tops and handles, together with its sturdy construction and extra capacity, makes the Duff-Norton Roof Jack adaptable to any mine roof requirement.

Other Duff-Norton jacks

shown will include ratchet and screw type lifting jacks of various sizes and capacities as required for mining work. *In charge—W. I. Floyd.*

• DU PONT DE NEMOURS & COMPANY, INC., E. I.

The wood preservative section of the du Pont exhibit will feature a demonstration of the fire retardant qualities of timber preserved with chromated zinc chloride.

A small piece of treated wood in the shape of a tie will be passed through flame by a mechanical device until charred. Visitors will be invited to take samples for further examination.

The background of the exhibit will show the retention of preservative in a mine tie after 16 years of service. Actual sections of this tie will be on display. *In charge—E. H. Rieman.*

• EDISON, INC., THOMAS A.

The exhibit will feature a typical assembly of Edison Nickel-Iron-Alkaline Storage Cells for motive power service in shuttle cars. The battery will be assembled in a permissible battery box. Exclusive Edison features in shuttle car service include unusual mechanical strength, non-critical charge adjustment (permitting charging from d-c lines without need of motor-generator) and light weight. The saving in weight in the battery on exhibition amounts to approximately 1,600 pounds. The Edison exhibit will also include a display panel showing the component parts of a steel storage cell, cutaway cells to show how they are assembled and an Edison Electric Cap Lamp energized by a small Edison Storage Battery. *In charge—J. K. Mabaffey.*

• ELECTRIC RAILWAY EQUIPMENT COMPANY, THE

Will feature in their exhibit a complete line of new fused type junction boxes. Numerous improvements have been made in the original design which was exhibited last year. In addition there will be exhibited an entirely new type safety junction box which when used in conjunction with a pilot circuit insures added safety.

Also shown will be special type steel base quick break switches of large carrying capacity, and recent developments in heavy duty type section insulators which do not require the use of the old style wooden beam; and standard trolley line materials. *In charge—A. L. Johnston and C. A. Cawood.*

• ELECTRIC RAILWAY IMPROVEMENT CO., THE

The exhibit will cover rail bonds of all designs and capacities for mining work including those recently developed of short length for economy of power and purchase price. The exhibit will also include bonding apparatus, welding equipment and welding rods for bonding purposes. *In charge—N. G. Carlson and P. T. Bevers.*

• ELECTRIC STORAGE BATTERY COMPANY, THE

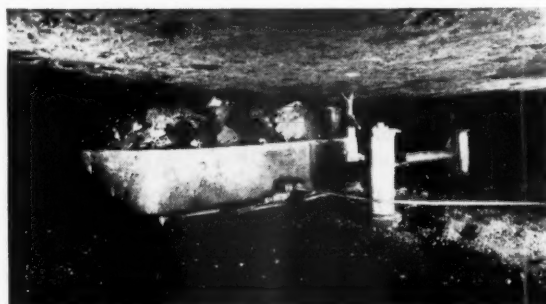
Four types of Exide-Ironclad cells, cut away to show construction, will be on display. These will be Types FLM, MEH, TLM and MVM. In addition, a 24-cell Type TLM will be shown. This battery is of particular interest at present because of its increasingly widespread use on shuttle cars. The complete battery is of 48 cells, with a 24-cell unit on each side of the shuttle car. Another type of Exide-Ironclad Battery to be exhibited will be Type ME,



assembled in hard-rubber container for locomotive service. *In charge—Wm. Van C. Brandt.*

• ENTERPRISE WHEEL & CAR CORPORATION

Expect to exhibit a modern steel stub axle, large capacity mine car along with movies showing the new Smith Drag Line Conveyor in use in West Virginia mines. This conveyor consists of one or more boxes with self-



dumping bottoms, a self-centering deflector, which enables the box to be pulled to any desired angle or position and a dump or loading ramp over the entry on which the boxes are pulled by a two-drum scraper hauler. *In charge—W. E. Meyers.*

• FAIRMONT MACHINERY CO. No description received.

• FLOCKER AND COMPANY, JOHN

The company, manufacturers and distributors of MOROPA Cotton Flame and Mildew Resistant Brattice Cloth, will display their product. A novel feature of the display will be a demonstration of MOROPA withstanding without flaming, the heat from a blow torch. A model of a small section of a coal mine, with MOROPA installed, will be the central theme of the exhibit. *In charge—R. R. Irwin.*

• FLOOD CITY BRASS AND ELECTRIC COMPANY

Exhibit will feature the new type CS-3 Car Spotting Hoist. Only 20 inches high, with a length of 80 inches and a width of 33½ inches, this hoist was developed for use in low seams. The sturdy base and frame, like that of the CS-1, is almost unbreakable. A non-reversible worm drive, so popular in the CS-1, eliminates the need for a special motor with attached brake and requires practically no maintenance. The low uniform height permits a pleasing streamline construction and an even more complete guarding of drum and gears. A newly developed, ball bearing, special hoist type motor with dust proof enclosure is ordinarily furnished, although any standard motor of low height can be used.

Also shown will be the standard line of replacement parts for locomotives and mining machines, and the various pumps and parts in which the company specializes. Accurately machined and carried in stock for quick service, these parts are cast in the company's foundry from the finest of materials.

The line material exhibit will feature the heavy duty trolley wheel with 1-in. axle which under actual test, when used with their special harp, has shown a life many times that of the smaller axle wheels. Other types of line material, splicers, etc., will be shown, including the patented by-pass splicer and 6/0 section switch with blades and contacts, which will carry more load than the trolley wire itself. *In charge—H. B. Hughes.*

• GENERAL ELECTRIC COMPANY

A feature of the exhibit will be an aluminum model of the new G-E Tri-Clad motor which in defiance of the law of gravity will float freely in the air over a low, round, table-like affair.

The exhibit will be devoted to representative electric equipment for modern underground service, including a representative array of Bureau of Mines type of direct-current motors and control and a direct-current air-circuit breaker of the type used for sectionalizing at cross entries of mines. An 8-ton G-E sealed-equipped, cable-reel locomotive operating on rollers will also be included in the exhibit.

Another portion of the exhibit will feature the line of recently announced Tri-Clad motors for many underground uses as well as for driving conveyors, vibrating screens, loading hoists, and other machinery above ground in coal tipples and preparation plants. *In charge—J. J. Huether and F. L. Stone.*

• GIBLARTAR EQUIPMENT & MANUFACTURING CO.

A new and unique feature of this display will have "Gemco Tru-Blu Super Men" on either corner of the booth. These will be the artists' conception of 8 ft. super men with four arms and four hands, to carry out the idea of Gemco Tru-Blu tools giving a miner the equivalent of an extra pair of hands.

For the first time the company will exhibit their car movers, new type

of car stops, rail levelers, and will feature the new multiple leverage punch rail up to 70 pound size; also mine car wheels in 10-in., 14-in., 16-in., and 21 $\frac{3}{4}$ -in. diameter as well as an economy special tool, and supply cars which have a wooden platform and no brake.

• GOODMAN MANUFACTURING COMPANY

Will feature Type 460-BH Track Loader, a government approved hydraulically controlled machine; Type 612-AB Universal Control De Luxe Shortwall Machine fitted with a 35-hp. motor, a 7 $\frac{1}{2}$ -ft. cutter bar and Type 41-B chain; Type GS15-B-74 Side Drive Shaker Conveyor; Type A1DG Telescopic Duckbill, an extremely short duckbill measuring over all 14 feet 3 inches and consisting mainly of three sections which telescope within themselves.



Also shown will be Type 512 Universal Control De Luxe Shortwall Machine with 50-hp. motor; a main group of Type 97C-30 Belt Conveyor. The driving unit is fitted with a 20-hp. motor and this particular belt has a capacity of 190 tons per hour; Type G-20 Shaker Conveyor Drive; Type G-12 $\frac{1}{2}$ Shaker Conveyor Drive fitted with a connecting trough; Type E-11 Shaker Conveyor Drive; Type JL-10 Shaker Conveyor Drive; Type K-8 Shaker Conveyor Drive; and two units of Type 95-16 Belt Type Face Conveyor. *In charge—J. D. James.*

• GORMAN-RUPP CO., THE. No description received.

• GOULD STORAGE BATTERY CORPORATION, THE

This exhibit will feature the Armored Kathanode Glass-Klad Battery for shuttle car and mine locomotive propulsion. Cutaway cells will be displayed in order that those who attend may readily see the details of the famous Kathanode assembly, which is the secret to the long life and dependable performance that these batteries afford.

Complete descriptive literature will be available for distribution. *In charge—S. E. Gane and W. H. Burkey.*

• GULF OIL CORPORATION

This exhibit will feature Gulf lubricants for all types of mine equipment. This includes mine car greases, specialized lubricants for generator bearings, cutting and loading machines, mine gathering pumps, air compressors, power plant and steam turbine equipment, and tippie and conveyor machinery.

• HAYNES STELLITE COMPANY.

See Union Carbide and Carbon Corp.

• HENDRICK MANUFACTURING COMPANY

The company will feature perforated metal screens for use in coal preparation. Emphasis will be placed on flange lip screens and dewatering screens, the latter made up in stainless steel.

Will also show a model of the new flat shaking and whipping screen, which is a new type of horizontal screen for sizing and dewatering coal. *In charge—H. S. Lee.*

• HERCULES POWDER COMPANY

Will emphasize the part that the correct selection and use of explosives play in the efficient mining of coal.

Carrying on the theme "Coal is Defense," the exhibit graphically shows how industry is benefited from proper mining of coal brought about by intelligent selection and use of explosives. *In charge—M. R. Budd.*

• HULBURT OIL & GREASE COMPANY

Samples of the company's full line of high quality lubricants will be on display in an attractive booth. *In charge—E. W. Wanner.*

• ILLINOIS GEOLOGICAL SURVEY DIVISION. No description received.

• I-T-E CIRCUIT BREAKER COMPANY

Will demonstrate a comprehensive line of direct current circuit breakers suitable for all phases of mechanized mining, including both the popular automatic reclosing types and the manually operated models.

The automatic reclosing units comprise a recently improved and redesigned Type KSA switchboard circuit breaker for service with semi-automatic and full automatic substations; a refined Type KSC circuit breaker for use on substation tie feeders, or mining sections of large capacity; and a smaller rated 600 ampere, Type KBA, circuit breaker especially designed for protecting the machinery and feeders of individual mechanized sections.

An inexpensive manually operated thermal Type ETB circuit breaker protects 4/0 and 6/0 trolley wire feeders against annealing and creating fire hazards from high resistance grounds in isolated sections.

The I-T-E load distributor will also be on display, this device permitting better distribution of power between motor-generator set or rotary converter substations in the same system feeding a common load.

Other relays for special protective services with mining substations will

be shown, the entire exhibit featuring the company's contribution to low cost mechanized mining having a high continuity of production. *In charge—Donald J. Baker.*

• JEFFREY MANUFACTURING CO., THE

The company will feature the "Big Three"—the 29-U Universal Coal Cutter, Track Mounted Drill and the new L-500 Loader.

In addition will be shown underground conveyors, hydraulic brakes for locomotives, small size coal washing unit, crusher for stoker coal sizes, electric vibrating screens and feeders, and renewal parts. *In charge—J. H. Fulford.*



• JOHNSON-MARCH CORPORATION, THE

Will have for show and demonstration COALADD, a chemical compound for permanent dustless treatment of coal and COMPOUND "M," for control of the dust hazard in the mines and tipples.

COALADD is well-known throughout the industry and its usage is increasing rapidly. It fulfills all the requirements of an ideal dustless treatment and its effectiveness is evidenced by universal customer acceptance.

COMPOUND "M" is a recently developed material which is added to water in the proportion of one part to a thousand and applied by spraying. This compound reduces the surface tension of the water and thereby causes it to spread instantly in a thin film. It is easily miscible and can be used with any kind of water or at any temperature. *In charge—Gloster P. Hevenor and others.*

• JOY MANUFACTURING CO.

Exhibit will contain a new 14 BU Joy Loader; a new low type 12 BU Joy Loader; the low 32-in. shuttle car and high 48-in. shuttle car. The booth and machinery will be similar to that shown last year with exception that a small machine will replace the large 11 BU machine. *In charge—Wm. L. Wearly.*

• KENSINGTON STEEL CO. No description received.

• KING POWDER COMPANY, INC., THE

Will feature Red Crown, a class "A" surface sensitized granular permissible explosive. Red Crown is a more efficient permissible powder that gives improved lump coal resulting from granular powder action.

Blasting and pellet powders, high explosives, and standard permissible powders and blasting supplies. *In charge—F. P. Morse.*

• KOPPERS COMPANY

Koppers will be represented with a 20-ft. exhibit consisting principally of background, although on exhibit will be Koppers Ar-Moored ties. The background will be well lighted, with translights showing interesting uses of wood preserving treated timber products in mines. *In charge—A. R. Joyce.*

• LA-DEL CONVEYOR & MANUFACTURING CO.

Will exhibit two radically new machines. The first is a crawler mounted low coal mobile loading machine designed basically for loading onto conveyors or into shuttle cars. The height to the coal line on this loader is only 21 inches and it is well suited for use in coal seams as low as 30 inches. The loader has been in service underground for many months, and is now ready to be placed on the market.

The second important device will be a large capacity type of shaker conveyor designed to handle capacities of 3 to 3 $\frac{1}{2}$ tons per minute and, therefore, to work successfully in conjunction with low coal loading machines or for gathering purposes. The third interesting item will be a portable mine blower with a gross weight of 85 pounds complete with motor and starter. This is less than half the weight of any mine blower that has ever been submitted to the mining industry.

In addition to this will be displays illustrating underground belt conveyors, chain conveyors, and large mine ventilating fans. *In charge—E. M. Platts.*

• LEE-NORSE COMPANY

Will exhibit two different models of the Koal-Mobile units: (1) Model KMC-461A Koal-Mobile (high type); and (2) Model KMC-431A Koal-Mobile (low type).

These models continue to feature the four-wheel drive and four-wheel steering application to these specially designed haulage units for coal mining; also the three-point suspended wheel mounting for all size cars.

The high discharge direct into mine cars has already proved of great advantage by simplifying working arrangement and permitting the use of



cable reel type units to a much greater extent than previously experienced.

Hydraulic controlled steering on the low type Koal-Mobile will be greatly appreciated by the operator who has to work under adverse low mining conditions. It replaces the conventional steering wheel with a finger tip hydraulic control lever.

Four-wheel hydraulic power brakes make the cars much safer on steep grades.

The company also manufactures rubber-tired trucks for short-wall mining machines and has pioneered the mounting of universal coal cutters on pneumatic tires. *In charge*—E. M. Arentzen.

• LESCHEN & SONS ROPE CO., A.

Samples of the well-known "Hercules" (Red-Strand) Wire Rope, furnished in either round strand and flattened strand constructions and in either the standard or preformed types will be shown. The display of samples will include all types and constructions used in the coal mining industry. *In charge*—W. C. Richards and others.

• LINDE AIR PRODUCTS COMPANY.

See Union Carbide and Carbon Corp.

• LINK-BELT COMPANY

Having for its theme "From Mine to Boiler," a large photo mural will show that Link-Belt makes equipment for every phase of coal handling—from mine to coal preparation plant, to power plant, and into the furnace of the boiler.

This comprises conveyors out of the mine; coal tippie and cleaning equipment; the Link-Belt air-pulsated wash box; crawler shovels and draglines for strip mines; coal and ashes handling equipment at the power plant; and automatic stokers for feeding the coal into the furnace, in the home and at industrial plants.

Particularly featured will be a full-size Link-Belt Mine Car Dumper, electrically operated through push button control the same as in an actual installation.

A scale model of a Link-Belt Rotary Railroad Car Dumper will be shown in operation.

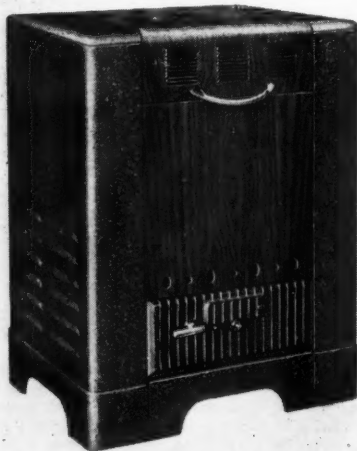
There will be a photo mural portraying the many users of Link-Belt Air-Pulsated Washers in the United States and throughout the world.

A multi-sided revolving display will feature Link-Belt Friction Fighter ball and roller bearing units. And there will be samples of belt conveyor idlers, speed reducers, conveying and power transmission chains and other power transmission items used by the coal industry. *In charge*—E. J. Burnell and others.

• LOCKE STOVE COMPANY

The feature attraction will be the new WARM MORNING cabinet heater under fire. This heater holds 100 pounds of coal and heats all day and night without refueling.

The attention-getter at the WARM MORNING booth will be a large Neon star with the words "WARM MORNING" flashing on and off and one of the heaters on a turntable in the center of the exhibit. Red leather seats are provided for this double booth, making it inviting for callers to pause for a visit. *In charge*—Murrel Crump.



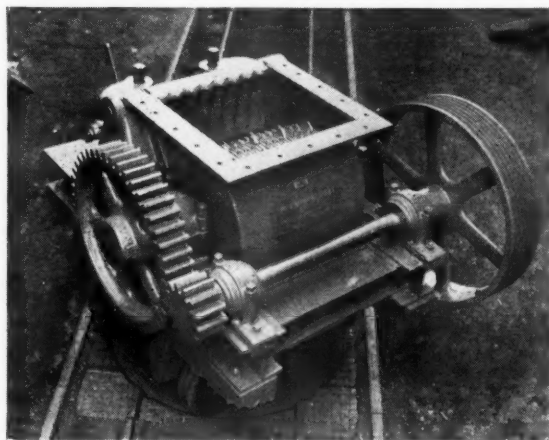
• MCGRAW-HILL PUBLISHING CO., INC.

The entire back panel of the Coal Age exhibit will tell the interesting story of the growth of mechanical mining and the part selected states played in this growth since 1930. The main feature will present a distortion map of the U. S. A. showing how various coal producing states rank in production and percent of total output during 1940. This panel will be designed to show the mining men in attendance, not only how their own state ranks in total output, but also how their state has grown in output per man hour since 1930.

COAL AGE will distribute from its booth the April Pre-Convention Number of the publication. . . . This year, more than ever, the issue will be of timely value to the coal producer attending the show, because of its vital editorial story, already announced to Uncle Sam's coal industry, "Coordination of Men, Management and Machines for National Defense Now! . . . and for King Coal's Victory in the Post-War Battle of the Fuels!"

• McLANAHAN AND STONE CORP.

Expect to display an 18 x 24 All-Steel Automatic Steelstrut Quick Adjustment Crusher.



In addition will have a small model crusher, photographs, etc. *In charge*—Craig McLanahan.

• McNALLY-PITTSBURG MFG. CORP., THE

Exhibit will consist of displays of McNally-Pittsburg installations, together with exhibits of cross-sections of the various pieces of McNally-Pittsburg special equipment such as the McNally-Norton Automatic Washer, Menzies Cone, McNally-Rheo Launders, Battelle Launders, McNally-Vissac Dryer, Carpenter Dryers and miscellaneous coal crushing equipment. In addition to these photographic displays, will have a small size working model of the McNally-Norton Automatic Washer. *In charge*—L. T. Merrill.

• MACWHYTE COMPANY

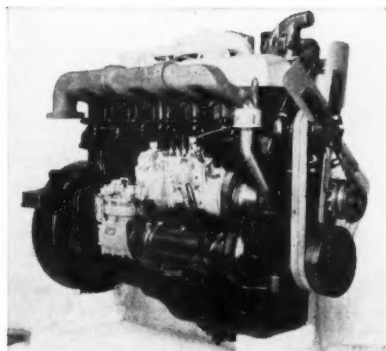
The feature of the exhibit will be the correct ropes for mining equipment. On display will be wire ropes from the smallest to the largest used in the mines, both PREformed wire rope and non-preformed wire rope with the famous Macwhyte Internal Lubrication. There will be shaft hoist ropes, mining machine ropes, loader ropes, scraper ropes, tugger and slusher ropes, ropes for carry type scrapers, loading shovels, and for the big strip shovels that are as large as 33-cu. yd. capacity; and there will be ropes for the large Monighan dragline machines, as well as track cable, car puller ropes, blast hole drilling ropes—in fact every conceivable type of rope used in underground, slope and open pit mining.

These ropes on display are constructed to give the ultimate service and will be tagged and carry a description so that mining men can investigate their properties and use. *In charge*—Verl P. Jenkins.

• MACK TRUCKS, INC.

Will offer an interesting and prominent exhibit of Mack equipment for the coal mining industry.

A feature of this Mack exhibit will be the display of one of Mack's series of Mack-Lanova diesel engines. The unit shown will be the Mack-Lanova Model END-605, an engine of 605-cu. in. piston displacement which develops 144 horsepower at governed speed of 2,000 r.p.m. As its name implies, the Mack-Lanova diesel employs the Lanova energy-cell combustion system which combines the highest practicable power per cubic inch with minimum peak pressures, bearing loads, fuel pressure and compression. To all the advantages contributed by this Lanova principle of controlled combustion have been added simplicity, steadiness of running,



dependability and durability by the highly-perfected mechanical design of the engine.

This 605-cu. in. Mack-Lanova diesel is the largest of three automotive diesels offered by Mack, diesels which have placed the Mack Company in the position of enjoying the largest output of diesel trucks in the United States of any manufacturer.

Also included in this Mack exhibit will be motion picture films showing both factory assembly and operation of the five huge chain-drive model FC six-wheel Mack trucks recently placed in service by the Tecumseh Coal Corp. in a coal stripping operation in southern Indiana. These trucks are the world's largest weighing 30 tons and packing a payload of 52 tons every time they swing under a huge electric shovel which itself is the largest ever built and weighs 3,000,000 pounds. *In charge—A. G. Crockett and Harry Seanor.*

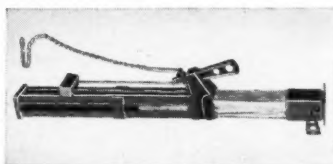
• **MANCHA STORAGE BATTERY LOCOMOTIVE CO.** See Goodman Manufacturing Co.

• **THE MARION STEAM SHOVEL COMPANY**

This exhibit will have a background showing a typical large coal stripping operation including both the stripping and loading shovels as well as haulage equipment in the pit. In addition, will be screened a movie which will show various sizes and types of the company's machines in coal stripping and loading service from the $\frac{3}{4}$ -cu. yd. size up to and including the 35-cu. yd. machine. This movie will include views from several operations and will show different types of machines available to meet a wide variety of conditions. *In charge—L. C. Mosley.*

• **MARKHAM PRODUCTS CO.**

This exhibit will feature the Markham Adjustable Mine Prop. This prop is what the name implies—a "SAFETY POST" for the production men at the face and men re-timbering in bad ground. Markham Props weigh approximately 35 pounds and are of all-steel welded construction. A 4 x 4-in. timber is used in connection with the hollow steel base, forming a telescoping arrangement—the timber being raised up or down inside the steel body. There are two steel wedges, one in the body which drives against the dog engaging the timber, thereby holding the timber rigidly in place at desired height. The engaging dog is toothed or knurled on the face where it comes in contact with timber. The automatic cap-board provides a means of both tightening the post to roof or can be used to release or loosen the post. The wedge in the cap-board provides an expansion of the cap piece of 1 inch—this tightening is done by driving the wedge.



The Markham Post has wide adjustability and can be set in 10 seconds and released as quickly. It is an accident preventor in that it can be set easily—at the same time, improve performance of mechanical equipment as well as individual wherever safety posts have to be set. Another safety feature found in no other post is the KNOCK-OUT BLOCK which can be used in releasing the post where set under dangerous roof. The props are made in heights from 14 inches to 60 inches. *In charge—D. D. Dodge and William H. Grace.*

• **MECHANIZATION, INC.** No description received.

• **METAL AND THERMIT CORPORATION**

Will exhibit equipment for Thermit welding of rail in main haulage track. While no actual demonstrations of welding will be given, all of the equipment for Thermit welding rail to reduce track maintenance and cut down power costs will be on hand for inspection, together with several actual sample rail welds.

In addition, applications of the Thermit process for the repair of shaker shafts and other equipment will be displayed. *In charge—Merritt L. Smith.*

• **MINE SAFETY APPLIANCES COMPANY**

A complete display of safety equipment for mining use will be exhibited by this company. Among the featured items at the exhibit will be the popular Model "P" Edison Electric Cap Lamp and the M.S.A. Self-

rescuer. New products on display will include the M.S.A. Miner's First Aid Kit, containing the revised list of materials specified in the 1940 edition of the U. S. Bureau of Mines' First Aid Manual; Foille Spray Kit for emergency treatment of burns; Comfo Cap-Eyeshield Assembly; and the improved Hand Lamp models.

Other M.S.A. safety products of interest to the mining industry will include Methane Alarms and Testers, Comfo and Dustfoe Respirators, Portable and Semi-Portable Rock Dust Distributors, Bakelite Explosives Carrier, Oxygen Breathing Apparatus, H-H Inhalator, a wide range of Gas Mask types, Goggles, Skullgards, and the M.S.A. line of Velocity Power Tools, including the Rail Punch and Cable Splicer, explosively-actuated portable tools which employ blank cartridges as a source of energy. *In charge—Gordon McVean.*

• **MINES EQUIPMENT CO.**

See Sullivan Machinery Co.

• **MINING MACHINE PARTS, INC.**

Will have on exhibit representative items showing improvement in material and/or design of replacement parts for underground mechanical equipment. Included will be "Dymonhard," the new hard surfacing alloy. This part of the exhibit will comprise hard surfacing rods for all high speed and severe duty mining operations. *In charge—W. P. Bigler.*

• **MYERS-WHALEY COMPANY**

Will exhibit their new "Automat," showing recent improvements, including the addition of an extra speed for more rapid tramping. The exhibit this year will dramatize, in unique fashion, the vertical action of



the "Automat" shovel and its safety features, in keeping with the—"more production, but safe production"—programs for 1941 of coal operators everywhere.

• **NAIL CITY BRONZE CO.**

No description received.

• **NATIONAL CARBON COMPANY, INC., CARBON SALES DIVISION.**

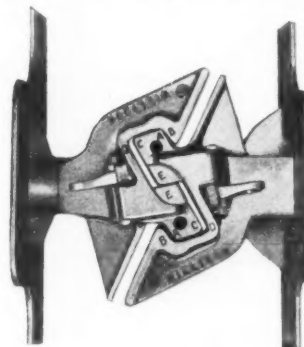
See Union Carbide and Carbon Corp.

• **NATIONAL ELECTRIC COIL COMPANY**

The company will have an activated display to represent ability to manufacture electric coils for motors and generators for the mining, steel, utility, and other industries; also will have on display samples of products. *In charge—Bailey Price.*

• **NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY**

Exhibit will feature the latest design in automatic mine car coupling



"The Willison Automatic Mine Car Coupler with Draft Gear Attachment," as applied to the larger capacity mine cars now under construction.

Also on display will be Naco cast steel mine car wheels and cast steel mine car hitchings. *In charge—L. L. McKee.*

• **NATIONAL TUBE COMPANY.**

See United States Steel Corporation.

• **NORDBERG MANUFACTURING CO.**

Will exhibit a full sized 3 x 10 Double-Deck Symons Screen with feed end drive. This will be motor driven and in operation. *In charge—Delbert Kay.*

• **OHIO BRASS COMPANY**

This exhibit will feature the line of Protection and Control Devices developed by the company especially for the electrical needs of mechanized mining. Also shown at the exhibit will be a complete line of locomotive equipment, including Headlights, Current Collectors, etc., and a complete line of Overhead Trolley and Feeder Materials including a newly designed smooth under-run sectionalizing switch and a smooth under-run trolley frog.

The center background of the booth will consist of a typical open-type and gas-proof power hook-up, showing how O-B Protective and Control Devices prevent general power breakdowns and keep production continuous. A system of sequence lighting will visualize the component parts of this system for the convention-goer.

On an illuminated shelf below the center panel, various O-B Safety and Control Devices will be displayed. Featured in this display will be a new 4-circuit Gas-Proof Distribution Box. *In charge—J. H. Sanford.*



• **OHIO CARBON COMPANY, THE**

Will again exhibit carbon, graphite and metal brushes as used on generators, motors, trains and locomotives and other brush bearing devices, also the commutator cleaner known as the burnishing tool. *In charge—I. W. Brandel.*

• **OSMOSE WOOD PRESERVING CO.**

The Wood Preserving Process of this company allows mine operators to utilize their own or locally obtained native woods. It eliminates the necessity of importing treated mine ties and timbers from distant points at high cost in order to secure added service life.

The keynote of the exhibit will be evidence of the fact that many leading companies throughout the coal mining areas of the United States have taken advantage of this highly effective process. They have not only saved many timber replacements, but have done so at extremely low cost, using local wood species and local or outside mine labor for application of the chemical preservative Osmosalts.

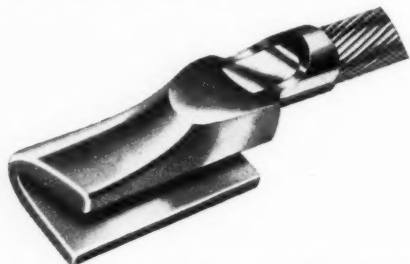
Moving pictures will be used to show how the Osmose Process works . . . from start to finish.

• **OWENS-CORNING FIBERGLAS CORPORATION**

Will have an exhibit that will show the part Fiberglas is playing in the defense program, particularly to show the use of Fiberglas insulation as applied to the coal industry. *In charge—Gil Baechle.*

• **PENN MACHINE COMPANY**

Most prominently featured will be the Everlast "Super-Weld" reversible rail bond—the bond which has been adopted as standard by many of the country's foremost coal-producing companies.



Other "Super-Weld" bonds to be displayed are: PM-4 "U" Type "Super-Weld" rail bonds; PM-5 "U" Type "Super-Weld" rail bonds; PM-10 "Super-Weld" minimum length joint bond; TP-9 "Super-Weld" rail bond—for temporary use.

Interesting translights will show actual photographs of rail bond manufacture and other plant operations. *In charge—Guy Little.*

• **PENNSYLVANIA ELECTRIC COIL CORP.**

No description received.

• **PHILCO CORPORATION**

The Storage Battery Division of the company will exhibit the new permissible type shuttle car battery now using the ventilating features obtained by the use of special corrugated linings.

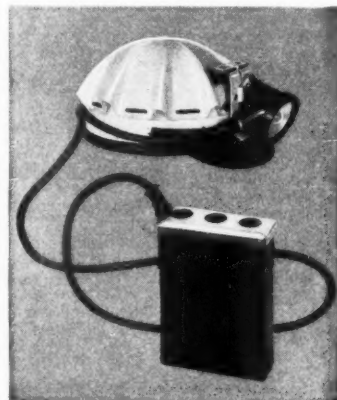
Also included in the exhibit will be samples of all types of storage battery cells used in industrial service, including capacities up to 6,000 A.H. *In charge—E. J. Ahlbauser.*

• **PORTABLE LAMP & EQUIPMENT COMPANY, THE**

Will feature a complete line of personal protective equipment for the mining industry. Outstanding features of the exhibit will be the Portable Electric Cap Lamp and the Portable Track Tackle Line of haulage safety devices.

Portable's Cap Lamp, distributed under a contract which is renewable annually, is doing much to relieve the problem of gradual light failure in mines. Because the contract guarantees that light volume from Portable's Cap Lamps will remain constant as long as Portable's lamps are in use, it is rapidly achieving popularity in all sections of the country. The Track Tackle Line is the result of extensive research by Portable engineers in an effort to reduce haulage accidents in the industry. It consists of new and improved car stops, skids, splicers, and a new streamlined switch signal.

Also displayed will be a complete line of goggles, respirators, safety shoes, cool caps and hats, safety belts, permissible blasting units, powder bags, heated first aid cabinets, stretcher boards, etc. *In charge—George C. Nelms.*



• **POST-GLOVER ELECTRIC COMPANY, THE**

Will display a complete line of P-G Steel Grid Resistors for locomotives, mining machines, and loaders, also Automatic Transfer Switches for gathering locomotives. *In charge—C. E. Nuckels.*

• **PRODUCTIVE EQUIPMENT CORPORATION**

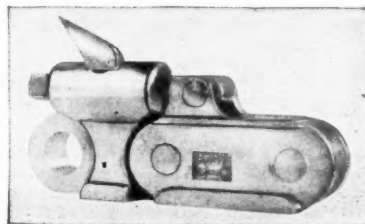
Will exhibit a standard size single deck Selectro Vibrating Screen of the open type, equipped with a music wire cloth which has proven very satisfactory in a great number of coal installations for dedusting of the finer sizes of coal.

Will also exhibit a small size unit of the Gyroset model which has been used to a great extent on sludge dewatering in connection with washing units. This unit can be had either in the suspended mounting or base mounting type—the unit which will be exhibited being base mounted. The Selectro is adjustable both as to angle and stroke and is of the positive eccentric type with floating shaft.

The Gyroset is a two-bearing eccentric unit adjustable as to the amount of eccentricity and also with floating shaft. *In charge—L. H. Lechman.*

• **PROX COMPANY, INC., FRANK**

Will have an attractive exhibit of their complete line of cutting units for all types of mining machines. In addition to the standard Invincible chains for mine bits they will also demonstrate the newest Prox cutter chain of the Tool Steel-Invincible type. This chain uses the Prox Tool Steel bits made of hardened alloy tool steel with a pair of cutting points



connected by a circular back rib. An ingenious and yet very simple and powerful clamping device is employed to hold these bits positively wedge-locked in the chain links. A single toolpost does the trick, a single hitch on the locking screw establishes the wedgelock. By actual test the Tool-Steel bit is changed much more rapidly

than ordinary mine bits can be changed, plus the advantage of having all the cutting points set to uniform gauge, plus the decidedly greater capacity released by the extreme hardness of the Tool Steel bits. These little double action circular backed cutting tools possess a cutting hardness closely approximating that of high speed tungsten steels. *In charge—Frank L. Fulke.*

• PURE OIL COMPANY, THE

Will exhibit machine parts used in equipment in the mining industry, together with lubricants particularly adaptable for their use. Lubrication engineers will be in attendance at the booth to discuss the proper lubrication of mining equipment. *In charge*—E. S. Miller.

• RELIANCE ELECTRIC & ENGINEERING COMPANY, THE

Will display direct current motors designed for underground use, particularly with a view to lower maintenance and less interruption from production and stoppage. In addition a new method of greasing bearings will be illustrated which eliminates the possibility of over-greasing and entrance of grease into the motors proper.

Will also display various types of motor windings.

• ROBERTS AND SCHAEFER COMPANY

The exhibit will consist of a full-sized model of the company's 1941 Air-Flow Coal Cleaner for fine coal; also photographs and new bulletins illustrating late coal preparation plants and featuring the development work on Air-Flow Coal Cleaner, the Hydro-Separator, and the Hydrotator Fine Coal Washer. *In charge*—R. G. Lawry.

• ROBINS CONVEYING BELT COMPANY

Will have a new model, streamlined background which, in addition to listing the products of the company and branch offices, shows with enlarged photographs some very interesting installations and unusual photographs of the products. A new Idler Stand on which will be mounted one of each type of our Belt Conveyor Idlers and a Model GYREX and VIBREX Screen, both in operation, will be on display. *In charge*—A. E. Conover.

• ROEBLING'S SONS COMPANY, JOHN A.

Will display the company's line of wire rope, electrical wires and cables and woven wire fabrics. This display will also be very modern in design, and the underlying motif will be the fact that the company has reached the mature age of 100 years.

• ROME CABLE CORPORATION

Will exhibit samples of the company's insulated wires and cables, featuring the Rome "60"—a product specially designed for locomotive and mining machine cable. Extreme adhesion between the insulation and the strand of the locomotive cable is designed to give service under the most severe conditions.

A motion picture of a copper wire mill in operation will be shown at intervals. Since this is one of the first industrial films showing a modern wire mill, it should be of interest to those in the production end, who are confronted with locomotive and mining machine cable problems. *In charge*—C. B. Llewellyn.

• SAFETY FIRST SUPPLY CO.

No description received.

• SANFORD DAY IRON WORKS, INC.

No description received.

• SCULLY STEEL PRODUCTS CORPORATION.

See United States Steel Corporation.

• SIMPLICITY ENGINEERING CO.

Will show two Simplicity Gyrating Coal Screens in operation. Because of its great success in making stoker coal and its popularity with the average size mine operator, a 3 x 6-ft. Model "C" Single Deck Screen will be displayed. A 5 x 12-ft. Model "D" Double Deck Screen, which is capable of taking heavy loads direct from weighing hoppers in a tippie, will also be displayed. These are two of the sizes of screens available in the Simplicity line, which includes all sizes of screens from a 2 x 3-ft. up to a 5 x 12-ft., built in single, double, triple and four deck units. The two Simplicity Gyrating Screens will be on exhibit in Booths No. 539-541. *In charge*—R. C. Johnson.

• SOCONY-VACUUM OIL COMPANY, INC.

In red, cream, and stainless steel, this exhibit will be built around "The Inside Story" motion picture—the Story of Correct Lubrication.

Flanking the screen, color photographs will illustrate various industrial uses of GARGOYLE LUBRICANTS. At the side, transparent plastic models of a bearing, a cylinder, and gears, symbolize the "featured players" of the picture—touched with red to indicate an oil film at the points where correct lubrication is vitally necessary. The bearing model can be demounted to demonstrate proper grooving and chamfering.

The message will be presented in a setting that reflects the importance of these products.

• STANDARD OIL CO. (Indiana)

Will have an exhibit of mining lubricants and coal spray oils. The men in charge, who specialize on coal mine lubrication and coal spraying problems, will answer questions and assist mine operators in solving operating and maintenance problems involved in lubrication, and discuss the Standard Oil Company's new line of coal spray oils. *In charge*—George J. Harman, and others.

• STEPHENS-ADAMSON MFG. CO.

Will feature the S-A Fine Coal Cleaner. A full size unit in running condition will be shown at Cincinnati.

This cleaner, which is already in operation at a number of important coal mining properties, cleans $\frac{3}{8}$ inch x 0 coal without the use of water.

It is possible to show the entire machine at the coal show, since the entire unit for cleaning 45 tons per hour measures only 15 feet by 9 feet by 8 feet.

• SULLIVAN MACHINERY COMPANY

Will have on exhibit the following equipment:

A complete line of Shortwall Coal Cutters, including the new 11-B Shortwall, a short length, low height, fast cutting machine which discharges cuttings at the rear.

Two new "Scooter" Haulers, double drum machines, which pull the "Scooter" when loading in thin seams where portable steel dumps or loading ramps are used.

A new rubber-tire mounted Air Compressor.

A complete line of Pneumatic Tools.

The color scheme will be red, white and blue, with "COAL IS DEFENSE" as the theme for the background display, attractively presented with neon lights. *In charge*—A. J. Leo.

• SUN OIL COMPANY

Various petroleum products produced by the company will be shown. The background will consist of a series of transparencies showing various operations throughout the mining industry. Technical experts on coal products on duty at the booth will answer questions which may be raised by coal operators either in reference to the lubrication of their equipment or the dust-proofing of coal with petroleum products.

• TALCOTT, INC., W. O. & M. W.

Will exhibit a complete line of belt fasteners for all conveyor, elevator and transmission belting along with their special Acme Patch Fastener for repairing all damaged belting. They will display sample sections of various belting properly spliced with the correct Talcott Fastener. The background of their booth will be made up of photographic enlargements of their product. *In charge*—M. W. Talcott and G. W. Little.

• TAMPING BAG COMPANY

Will have on exhibit a DUMMY MAKER, and SEAL-TITE TAMPING BAGS, together with a few other specialties. *In charge*—Alfred E. Pickard.

• TEMPLETON, KENLY & CO.

The complete line of Simplex Mine Jacks will be exhibited.

The 5, 7½, 10, 15, 20, 25 and 35-ton Lever Jacks will be on display for cutting and loading machines, rerailing mine cars and locomotives and shop, track, car and maintenance work.

The new Nos. M8 8-ton and M16 16-ton Mine Roof Jacks for mechanical mining will be displayed for the first time. Lever and Screw Type Timber Jacks and the new No. 366, which tightens against the roof and bottom, will be displayed.

Other jacks include Journal Jacks, Wire Tensioning Jacks, Push and Pull Jacks, Ball Bearing Screw Jacks and Anchor (or Hold-Down) Jacks.

The company's new line of Simplex Heavy Duty Hydraulic Jacks will be exhibited for the first time. *In charge*—William Simpson.



• TENNESSEE COAL, IRON AND RAILROAD COMPANY.

See United States Steel Corporation.

• TIDE WATER ASSOCIATED OIL COMPANY

Will feature a unique diorama consisting of a night industrial scene composed of miniature steel mills, a coal mine and a metal finishing industry with miniature communities, etc. There will be typical noises from these three industries and moving railroad trains.

There will also be another prize drawing held at the booth such as was held last year.

• TIMKEN ROLLER BEARING COMPANY

Exhibit will consist of cut-away sections of Timken Bearings as applied to mine car axles and other mining machinery.

The exhibit will have an attractive background and ample floor space to take care of eight or ten visitors at one time.

There will be free literature available on application of Timken Bearings to mining equipment.

• TOOL STEEL GEAR AND PINION CO.

Exhibit will consist of miscellaneous tool steel hardened gears and pinions and similar products as used in coal mining service. *In charge—LeRoy R. Brooks.*

• TRAYBON ENGINEERING CORP.

No description received.

• TYLER CO., THE W. S.

Will show the Ty-Rock full-floating circle-throw screen and also the Type 400 electric screen, in addition to Tyler woven wire screen, Tyler standard testing sieves and sieve testing equipment.

Both the Ty-Rock and Type 400 screens will be in operation. *In charge—G. R. Delamater.*

• UNION CARBIDE AND CARBON CORPORATION

The Linde Air Products Company, National Carbon Company, Inc., Carbon Sales Division, and Haynes Stellite Company, units of Union Carbide and Carbon Corporation, will have a joint exhibit.

The Linde Air Products Company's exhibit will feature welding and cutting blowpipes and various applications of the oxy-acetylene process that contribute to economical operation in the coal mining industry. Also featured will be Miners Lamp Union Carbide. National Carbon Company, Inc., Carbon Sales Division, will display electric motor brushes and various other carbon products, including "Karbate" pipe, fittings, valves, and carbon brick. Haynes Stellite Company will show hard-facing applications that increase the life of wearing surfaces, such as the application of Haynes Stellite alloy and Haystellite tube rod to coal undercutter bits. *In charge—J. S. Barker and others; for National Carbon Company, Inc., Carbon Sales Division—A. L. Munson, H. L. Shepard; for Haynes Stellite Company—George F. Reese.*

• UNION WIRE ROPE CORPORATION

Will exhibit several educational displays, illustrating the various types of rope constructions.

There will also be present at all times, in the booth, two or three representatives, for the purpose of discussing rope problems, or for answering questions regarding any phase of mining rope usage. *In charge—P. A. Wattle.*

• UNITED ENGINEERS & CONSTRUCTORS

No description received.

• UNITED STATES BUREAU OF MINES

Will highlight the hazards of coal mining, and offer safety recommendations to reduce these hazards.

• UNITED STATES RUBBER COMPANY

Display will consist of a Trans Lux announcement tape machine. This will contain news of the convention; personals regarding any one who comes to the booth whom we know; and of course some advertising concerning U. S. Mining Machine Cable and other products of the company.

Along with it will be an exhibit showing an old mine car drawn by a donkey. Sitting on this will be the well known U. S. Rubber Wire figure "Usrubby." But he will have no head. There will

be a cut out for the visitor to the booth to stick his head through and have his picture taken as "Usrubby" riding on the mine car, indicating that this method of conveying coal is out of date and that electrical devices and other modern equipment should be employed to do the job. A prize will be awarded for the most interesting picture taken at the booth.

In addition, samples of U. S. Rubber Mining Machine Cable will be available. *In charge—H. B. Allison.*

• UNITED STATES STEEL CORPORATION

United States Steel Corporation subsidiaries will present a joint exhibit. Cooperating in this exhibit will be American Bridge Company, American Steel & Wire Company, Carnegie-Illinois Steel Corporation, National Tube Company, Scully Steel Products Company and Tennessee Coal, Iron & Railroad Company.

The exhibit will include a special display of electrical wires and cables which demonstrates how corona losses may be eliminated by the new conducting rubber protection now available for mine use. Another display will illustrate how wire rope life is prolonged or seriously impaired by correct or improper operating conditions. Sections of wire rope taken from installations to show the effect of various conditions found in the field will be demonstrated.

Other features will include samples of various tubular steel products used in the mining industry, including Duroline cement lined pipe, rail bonds and other electrical and track accessories. Examples will be shown of the use of high tensile steels for reducing weight or increasing strength

in mine cars, cages, skips and hoists, with samples and test pieces taken from operating installations.

A new type of lounge area will be provided where visitors may rest or discuss problems with subsidiary representatives who will be on hand at all times.

• WATT CAR AND WHEEL CO., THE

Will have photographs and blue prints of modern cars, which have recently been furnished to mining companies. *In charge—R. L. Edgar.*

• WEIR KILBY CORPORATION

Will exhibit special railway track material including the Weir Titan Frog, switches, guard rails, switch stands and all accessories pertaining to mine and industrial turnouts, with special emphasis on light rail construction. *In charge—O. DeG. Vanderbilt, III.*

• WESTERN CARTRIDGE COMPANY

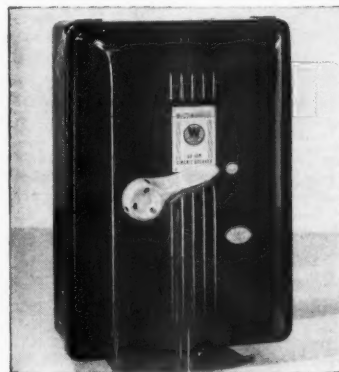
Various types of Western Blasting Caps mounted on a specially designed and colorful background panel for easy visual presentation will be exhibited by this company. Besides being modernistic in design, the vivid colors combined with illumination and the Western trade mark make a very inviting setting.

The exhibit will make it easy for an interested visitor to inspect the cap best suited to his blasting problems. *In charge—H. E. Mabry.*

• WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY

The company will feature an 8-ton explosion-tested gathering locomotive mounted on rollers which will allow operation of the locomotive. Power to operate the locomotive will be furnished by a 500-kw. ignitron rectifier.

The latest design of mining type starters will be shown operating type



SK mining motors so as to demonstrate the operation of the starters under load.

A type ASL air-cooled and air-insulated transformer will also be shown, which is the latest development of Westinghouse in the line of transformers.

There will, in addition, be a complete exhibit of maintenance and repair parts with line material also featured.

• WEST VIRGINIA GEOLOGICAL & ECONOMIC SURVEY. No description received.

• WEST VIRGINIA RAIL COMPANY, THE

The company will exhibit their general line of standard mine ties, and standard heavy duty rail and manganese frogs.

Will also show for the first time a new self-locking, toggle motion parallel throw stand recently developed. It is intended particularly for mechanical mines, and has not been shown anywhere prior to this time. It incorporates some features of both safety and permanence that no stand on the market now has.

Will also have a new line of offset joint rails. These are a new addition to the line of the company, and are intended to take the place of offset bars, or combination joints. *In charge—J. B. Haskell.*

• WHEAT LAMP SALES, INC.

A complete working installation of Wheat Electric Cap Lamps with the various models now available, as well as the Koehler Flame Safety Lamps and a line of safety and commercial types of spotlights with rechargeable batteries will be shown. Also a very complete exhibit of early types of lamps that have been used for underground lighting in the past.

• WOOD PRESERVING CORP.

See Koppers Co.

When industry calls for more coal...



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Booth No. 533
American Mining
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Exide
IRONCLAD
BATTERIES

**Exide-Ironclad Batteries
help the mines deliver
...ON SCHEDULE!**

THERE is scarcely an industry in America that did not use more coal last year than the year before. In round figures, the railroads used 6% more, the utilities 15%, pig-iron manufacturers 34%, and various other basic industries, including steel mills, 17% more. There can be little doubt that coal consumption will increase still further during the present year.

By providing mine locomotives and shuttle cars with dependable power, Exide-Ironclad Batteries played an important part in helping the mining industry step up its 1940 coal production. Still more can these batteries help supply the need for greater haulage capacity and higher speed to meet the nation's mounting coal requirements in coming months.

Exide-Ironclads reduce bottlenecks in underground haulage. Their outstanding feature is dependability—a quality that becomes many times more essential when the “pressure” is on to produce greater tonnage per day in time of national emergency. They have high power ability for unusual loads and grades, sustained voltage for consistently good haulage speeds, and a service life that far exceeds their guarantee in many instances. Write for free booklet, “The Storage Battery Locomotive for Underground Haulage.”

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

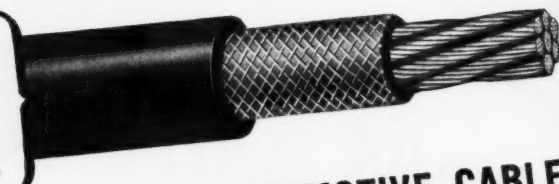
AT BOOTH P... U. S. RUBBER
COMPANY... AMERICAN
MINING CONGRESS COAL
CONVENTION... MUSIC HALL
... CINCINNATI, OHIO...
APRIL 28TH TO MAY 2ND

UNITED STATES

CONVENTION NEWS... PERSONAL

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BE A WINNER AS USRUBBY
(There's a prize for the best picture)

ALWAYS
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**A special process which permits the greater use of the toughening ingredient in rubber—making a dense, perfectly uniform compound.*



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NEWS...U.S. RUBBER NEWS...

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WAY OUT, JENNY,
OLD GAL! ELECTRIFIED
MINING'S THE THING!**

We'll snap a picture of you... riding high, wide, and handsome on the old "jenny-cart" as USRUBBY, the U. S. Rubber Wire Man...if you come to our booth (P) at the Exposition. Here you can also get a quick picture of your saving in cable costs, over the year, by using U. S. Royal Cords and Cables of **TRIPLE TEMPERED RUBBER** ...which have been delivering \$1.57 in performance for each \$1.00 invested.



United States Rubber Company

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You Can't Know EVERYTHING
about coal mining . . .

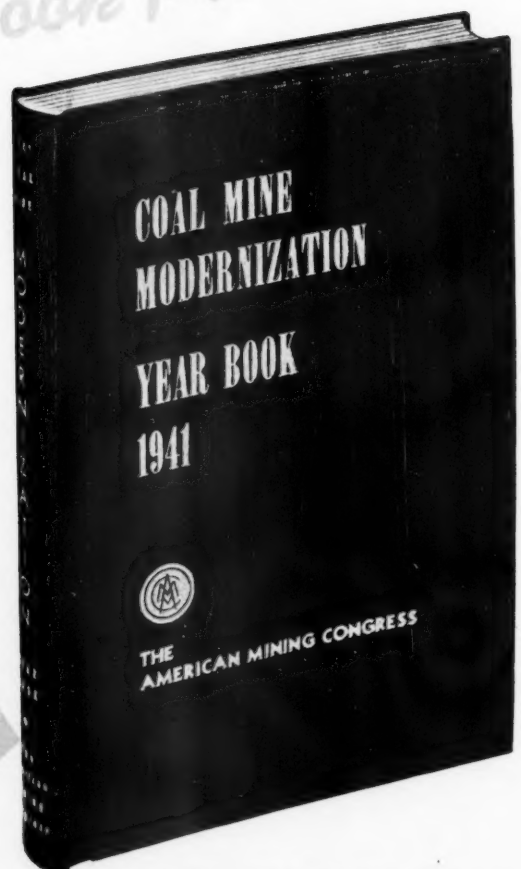
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MUNSEY BUILDING AMERICAN MINING CONGRESS WASHINGTON, D. C.

RUBBER TIRED HAULAGE



Preparation plant and tipples of Crescent Coal Company

With Bad Roof Conditions at New Paradise Mine

IN NOVEMBER, 1938, Crescent Coal Company started sinking its new slope for the Paradise mine, in Muhlenberg County, Ky. The slope was driven on an 18° pitch, 7 ft. high and 16 ft. wide. Timbering brought dimensions down to 6 by 14 ft. Slope length is 438 ft.

Driving and Timbering of the Slope

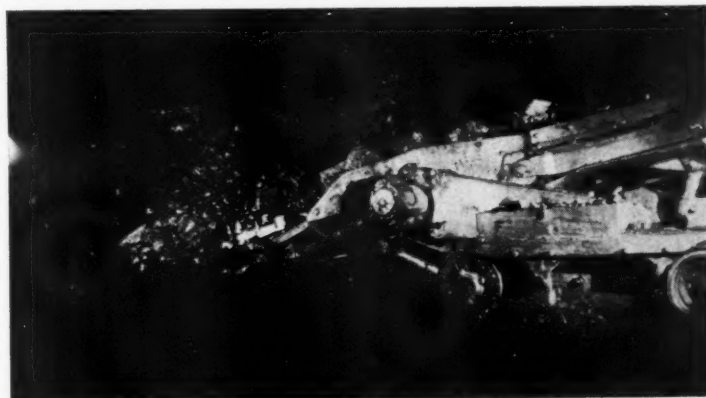
A Joy 8 BU loading machine was employed and the job was completed in 93 days of three shifts each. The machine was not in service daily, as timbering was kept within 12 ft. of the face. No water was encountered and the machine had good traction at all times. Average advance per day

● *Mr. Padgett Describes the Operation of the New Paradise Mine, and the Particular Attention Paid to Timbering for Bad Roof Conditions.*

By **WARD PADGETT**
Superintendent
Crescent Coal Company

was 19 ft., with a maximum of 35 ft. in 24 hours. The slope was concreted for 105 ft. down, then timbers of 10 x 12 and oak bars on legs of the same size, were used on 4-ft. centers. When the slope hit the coal the roof was a black slate which was very tender, and required the use of cross bars

which are 70 lb. steel rail with oak legs on 4-ft. centers, and 4-in. by 4-in. ties 4-ft. long were used as stringers. The ties were beveled on the top at both ends and driven in the groove formed by the base of the rails. The bevel lets the ties extend above the rail tops against the roof. This was done on all main entries.

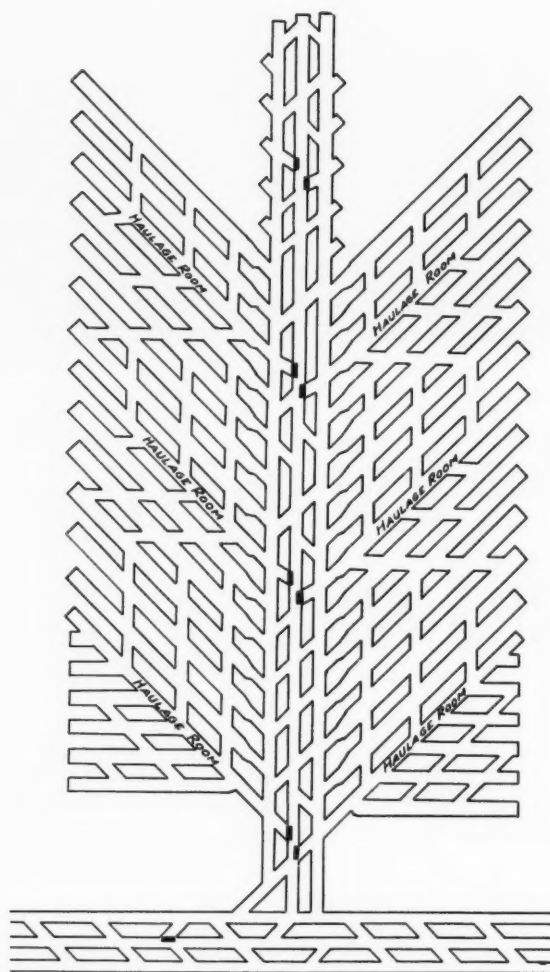


Joy loader at the face, Paradise mine

Bad Roof Required Heavy Timbering

After advancing a sufficient distance to turn room entries, it was discovered that the top was still very tender and required the use of bars in rooms, which had to be carried also on 4-ft. centers and from 1 to 6 ft. from the working face, which cut the room width to 16 and 18 ft. After advancing in the rooms a short distance it was found that the roof would break the 4-in. x 8-in x 12-ft. oak bars used in the rooms.

This presented quite a problem, since the coal seam ranges from 4 ft. 10 in. to 5 ft. in thickness, and it was



Standard Panel Development

Black rectangles indicate position of loading platforms. After driving to the limit, the panel will be finished by driving short rooms, as in Room 1

room serve as a haulage way directly to the loading station. On room entries the center entry is used for track and loading station where the bottom is taken up to lower track through the dump.

When the loading point is to be established the thickness of bottom lifted is gradually increased from an average of 12 in. to 28 in. at the lowest point below coal bottom. Enough track is laid through the dip for a trip of 9 cars, moved through the loading point by locomotives.

Schedule of Face Operations

Face operations follow the usual routine of timbering, cutting, bug-dusting, drilling, shooting and loading. In cutting, the aim is, where possible, to cut as near the clay as practicable, but if slips and rams result in a thick bottom it is taken up to preserve working height. A room 18 ft. wide is shot with three holes near the top of the seam, starting about 12 in. down and angling toward the top but not touching the slate in back. The loading machine loads into the shuttle cars, which, in turn, load directly into mine cars from platforms built at each loading station.

Coal moves from loading station to slope bottom in Sanford-Day 1-2-3 drop bottom cars with 14-in. diameter wheels. Cars are 28 in. high, 6 ft. wide and 12 ft. long inside. The usual trips at present are composed of 3 mine cars, which takes care of the complete operation. Hauling is accomplished with two 10-ton Goodman and one 6-ton G. E. trolley locomotives, using one on main haulage and two at the loading stations. The average hauling distance at present is 1½ miles round trip, causing each mine car to have a turn-over from 26 to 30 times a day.

Some of our most difficult problems

very difficult to know how we could use heavier timber and still maintain loading clearance. After several experiments it was found that by keeping the roof thoroughly rock-dusted the air was kept away from the roof and thus eliminated about 50 percent of the roof falls.

shuttle cars after each loading machine.

High production is secured from each loader by putting in loading stations every 250 to 300 ft. In addition, room and cross cut layout makes one

Systematic Mining Plan Adopted

It was found that by keeping 5 rooms as a set-up we could keep from 5 to 7 working places, which will just keep the loading machine in coal. These 5 rooms are worked the full depth of 350 ft., then the unit is moved into 5 more rooms.

Production equipment consists of: Four 8 BU loading machines; four Universal shortwall cutting machines, with 7½ ft. cutter bars, moved about on caterpillar trucks; post mounted drills with coal master augers, heads and bits; eight 3½ ton shuttle cars with 275 amp. hr. batteries, using 2



Mouth of Paradise slope



Shuttle car dumping into mine car

were: bad roof; dust control; and prevention of accidents. Roof control has been taken care of by the use of plenty of timbers and keeping the places thoroughly rock-dusted. Rock-dusting thus serves a two-fold purpose; both roof and dust control. Coal dust is also controlled by sprinkling and the use of calcium chloride put on the roadways in flake form. This draws the moisture from the air and causes the roadways to pack. Moisture is added to the air by the use of sprays in the airway. After this has been done the roadways are packed with a drag made from 90-lb. railroad steel in an "A" form. This is hooked on behind the shuttle cars and makes the roadways smooth and hard.

Safety an Important Consideration

The most difficult problem was the reduction of accidents, a plan for the reduction of which took some time. The first step was to give each employee first aid training, and try to make him safety-conscious. Then a Safety Chapter was organized by the employees. They had monthly meetings and discussed all problems and hazards that they might have had or seen. After this, accidents began to decrease, and have continued to decrease until at the present time there are 60 percent less accidents than when the chapter was first organized.

The coal is conveyed from the storage bin on the bottom to the tippie,

by means of a 36-in. special coal belt, having a reciprocating feeder located in the bottom of the bin to place the load evenly on the belt. The drive for the equipment is located at the tippie end of the belt.

Outside Plant Modern and Well Equipped

Owing to low cost timber being available on the company land, the tippie is of wooden construction with corrugated sheet sides and roof. All electrical wiring is in flexible conduit and plant controls are centralized in three push-button stations. Near each motor is an emergency stop button. The main shaker screens, vibrating screens and main and auxiliary mixing conveyors, as well as part of the loading booms, were purchased from and installed by the Morrow Manufacturing Company.

The tippie has six loading tracks, being equipped with five loading booms and picking tables. There is further provision made to wash all coal from 6 in. down, and special mixing equipment for stoker coal production and de-dusting screens at 10 and 28 mesh. Belknap chloride washers are used for the 6 x 2 coal with a straight wet washer equipment for the minus 2 in., with provision made for reclaiming coal from the middlings. In addition, all sizes may be oil-treated.

CARE OF WIRE ROPES—Lubrication

TO OBTAIN the best service from wire rope, either in length of time in operation or quantity of material handled, the rope must be used correctly, and properly maintained. It must be prepared for use in accordance with recommended practice, the construction must be rightly selected, and the conditions under which it is used must be kept as near ideal as possible.

The subject of correct preparation is treated in this article, as it may well come first. A rope has been properly prepared when it leaves the factory, and suggestions are herein made for keeping it in good physical condition.

Probably one of the most frequent of admonitions addressed to wire rope users at present is—lubricate your ropes. This is usually understood to mean for the purpose of reducing internal and sheave friction, but in practice it is extended to include as

● *Wire Ropes Must Be Kept Properly Lubricated to Obtain the Maximum Service Which the Manufacturer Builds into Them.*

By **WALTER C. RICHARDS**

Assistant Engineer
A. Leschen & Sons Rope Co.

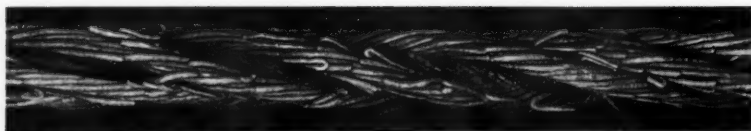
well protection from outside destructive agents.

Lubrication Protects Against Internal Abrasion

In all cases we can say whatever is applied protects to a certain extent, be it light oil intended for the interior or heavy "protector" primarily intended for the exterior only. Wires not only slide on themselves but are exposed to external abrasion. A lubri-

cant protects the wires from each other—from the internal friction as they rub against each other when the rope moves over sheaves or winds on a drum. Internal lubrication not only reduces abrasion but promotes flexibility, which is a most important feature with fast-moving ropes.

It has often been stated that wire rope is like a complicated machine, having many moving parts which are continually rubbing against each other as the rope flexes in service. From 7



Slope rope destroyed by the action of acid mine water. Two strands removed to show condition of interior



Rope employed in a shaft that was very wet. Outside wires entirely eaten through

to 61 or more wires (arranged in a number of ways) are twisted together to form the strands, and usually six strands are combined to form the completed rope. They are laid around a hemp center, a metallic core or strand center, or a wire-rope center.

The Core Cannot be Depended Upon Indefinitely to Keep Strands Lubricated

In times past the hemp centers were heavily lubricated and were depended upon to feed the lubricant out through the wires and strands while the rope was in service. A rope with a wire-rope center or metallic core, on the other hand, was not so lubricated from the inside, and outside applications only were possible. Under present methods of manufacture the hemp center is not expected to carry lubricant to coat the wires. It has been found that while in use the rope center cannot be relied upon to act as a reservoir alternately to give out and absorb the lubricant over a certain period. Instead, when most of the lubricant has been squeezed out, and the balance dried or leached out, the core will absorb moisture.

Both Internal and External Applications Needed

Hard fibres do not in themselves absorb oil. Present practice is to treat the core with a preparation to protect these fibres, after which an external application of lubricant is given. This acts as the base or beginning of the rope preparation. Strands are treated in manufacture with a special heavy-bodied preparation for both lubrication and protective purposes. It is heated and applied freely at the center of the strand as it comes from the machine, so that each wire is entirely covered. The excess is wiped off and returned to the container. External

applications made at the factory are of a slightly different compound, to seal the rope against external corrosive agents.

Applications Must be Made During Service

The rope thus prepared during manufacture is shipped to the consumer, and at this point the responsibility of the user begins. He should not assume that, because ropes come from the factory in a lubricated and protected state, further attention is

unnecessary. In service the protective coating wears off, and the internal lubricant squeezes out. Both must be replaced. The method of application and its frequency depend upon the particular operating conditions, and the operator, being familiar with these conditions, should time his applications accordingly. Applications in the field are not always easy to make, and for this reason the best job is not always done. The user may think he does, and neglects, therefore, to keep close watch of the rope's appearance. Too often he thinks only of lubrication as a protection against friction (between wires and strands and in sheaves) and gives little if any thought to protection against corrosion.

Insufficient Lubrication Destroys Ropes

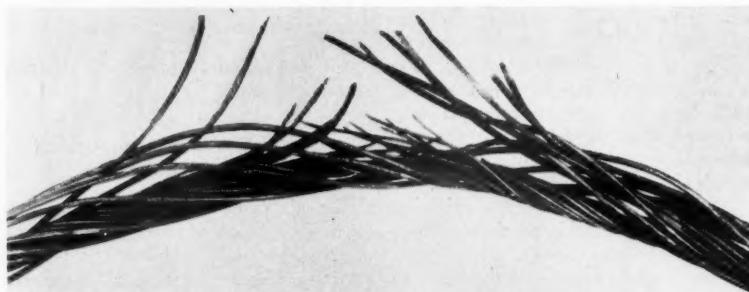
It can be truthfully said that as many ropes are destroyed through careless handling as by normal wear. Insufficient and faulty lubrication and protection come under the head of carelessness. Rope men in the field are continually finding cases of corrosion, of which the operator seemed entirely ignorant. The accusation of carelessness might be qualified by say-



Rope operating in a wet shaft showing wires greatly reduced in diameter. The loosened wires have been forced out of place



A well-protected traction rope that was removed from an aerial rope tramway



A broken strand that showed very good wear and little corrosion on the outside wires, but the pitted interior wires showed a very definite lack of lubrication

ing that many users do not recognize the symptoms of corrosion.

Consider, first, what working conditions actually contribute to corrosion, that should put the operator on the alert. Steel is attacked by certain liquids and gases, and it should be the operator's first consideration to keep them, if possible, from coming in contact with the rope. Obviously it is impossible to do this in many cases. Ropes must work in water or other liquids on certain jobs, and on others in the presence of gases carrying corrosive elements. As examples (to mention only a few) we have many mine shaft and slope ropes; inhaul and outhaul ropes on slacklines and power-scraper outfits; and other outside ropes, such as guy ropes, track ropes, boom ropes, etc. Shovel and drag ropes, and many others, generally wear out from abrasion before damage from corrosion becomes serious.

Rust and Corrosion are Enemies of Ropes

Any operator having to do with a wet shaft or slope should be constantly on the lookout for signs of rust. These signs do not always appear first on the outside, but he should know corrosion is likely to be present and give the rope frequent applications of lubricant. He may have two or three rope failures before this is impressed upon him, but an internal examination of the points of failure should be sufficient warning for the future.

The wires of a rope that is dry inside may "freeze" together to the extent that a strand will not have free movement, and at a moment of overstress will part. Dripping water may so rust the wires in a shaft rope that the ever-present vibration will fatigue and break them prematurely. A slope rope may lay, at every trip, in a damp or wet depression, and thereby accumulate moisture at a very localized spot; it may drag over wet coal (or earth) near the bottom of the slope; or the water may drip from the roof and run down the rope, gathering at some point near the lower fastening. This may even occur within the socket, if a poor connection has been made.

Effects of Corrosion

After internal corrosion has progressed so far, it is almost certain to show in some way on the surface. Wires may become loose and raise up, so that they take more than their share of abrasion, and are worn thin,

and break, or are worn entirely through to knife edges (or needle points). If this rope is examined carefully it will usually be found that corrosion has been attacking the underside of the outer wires where they contact the next layer below. *Extreme* corrosion of the outer wires should be very noticeable, but it is evident that this condition is *not* generally recognized by many operators. The diameter of the wire is reduced until the spaces between wires are very wide, and the wires are loose, and their surface pitted. If the loads are not great enough to break the rope at this point, the condition progresses until each outside wire is worn through on the crown, and the rope looks "moth-eaten." If this rope is opened up, and the wires bent, they are found to be "dead," and will frequently break at the first flexure. The center will be found to be dry, and the fibres brittle, and probably crushed.

Frequently the center will be found in good condition and the inner wires of each strand covered with lubricant, but the outer wires badly corroded. This is proof that the external applications were too infrequent, and the internal protection was gradually being washed out and replaced by water.

Types of Lubricant to be Employed

The characteristics of the ideal lubricant have been repeatedly described. It should be thin enough to penetrate, but not thin enough to run off. It not only should penetrate but also have the property of flowing slowly back to the surface, repeating the process until worn out. It should penetrate to the core, but be so viscous that it will not be forced out completely, under load. It must not cake or ball up and fly off the rope, nor be affected by heat to the extent that it will run off. It must penetrate and adhere, to form a flexible covering for the wires.

In the factory the lubricant is applied hot. On the job heat is frequently necessary if a full-bodied lubricant is used but, in practice, the rope is frequently cold and the lubricant is chilled before it can penetrate, thereby reducing the effectiveness of the treatment. If the full-bodied lubricant cannot be applied slowly and carefully, a thinner-bodied lubricant, more frequently applied, should be employed. In the long run the latter course would probably be the better to follow, with this added suggestion: Start replacing the washed and worn

off lubricant and protector before water gets into the rope between the strands and under the wires. After the water has once penetrated, no good is accomplished by sealing it in with an external coating of very thick compound.

Corrosion can hardly be prevented entirely, but it can be materially retarded, and that certainly is what the operator desires and should know how to accomplish. He should undertake to apply often a thin lubricant, for the inside, and whenever practicable a heavier preparation for protection on the outside. The complete effectiveness of both should not be expected in any one single product, although there are products that have some of the more desirable properties of each. The ideal way, then, is both to lubricate and protect. It is a question whether the extreme fluidity should be secured by heating, or thinning with another agent. Each has certain advantages, and it is good practice to alternate the methods of treatment, using a compound that is both a lubricant and a protector. The cooling or drying on the outside will seal in the more liquid interior portion.

Different working conditions call for variations in the type to be used, and in the methods of application. A thin but tenacious compound is said to be best where water and sand are encountered, although most operators forego all lubrication when working in sand. A thin coating would hold the sand loosely, so that it could be readily washed off. For sand alone, however, a dry rope is usually permitted, because of its comparatively short life. Where water alone is encountered, very heavy internal and external treatment should be given. A heavy lubricant is also desirable in the presence of gases containing acid-forming elements.

Methods of Application

A number of handbooks and special articles are available that may be consulted for the details of the mechanics of application. Running ropes can be passed through a trough, if horizontal, or a variety of open-top containers, if vertical. A bunch of waste or other similar material is placed around the outlet, to wipe off the excess. If a sheave is convenient, some users prefer to pour the lubricant in the groove as the rope passes under the sheave; or onto the rope itself at that point, if it passes over the sheave. Under certain conditions it may be found more convenient to brush the lubricant on as the rope is slowly advanced

or when it is stationary, as on a drum. This is the only way to treat a standing rope, except in the case of tramway and cableway track ropes, where the lubricant is allowed to drip on the ropes from a moving carrier, and spread under the passing carrier wheels. To be most effective it is, of course, understood that before ap-

plying the lubricant the rope should be as clean and free from foreign material as possible.

Treatment for Storage

Ropes to be stored for any length of time should be cleaned and lubricated by the most convenient method

as they are being reeled up. As an added precaution each layer should be gone over with a brush application as the layers are filled. If the storage is close to salt water, or where acid fumes might be present, an extra heavy external coating should be given, with a final covering of tar paper or other resistant material.

RECLAIMING BALL-MILL TRUNNIONS*

Cast Iron Welding Permits Worn Section to be Replaced at Small Cost

ONE of the more common items of ball-mill maintenance is the replacement of trunnions through which the ore is introduced into the mill for grinding. Constant abrasion by the ore in passing through this part results in excessive wear at the inner end, and, since the entire trunnion is cast as one piece, replacement, until recently, has been costly. Now, by following the procedures described and illustrated here, the maintenance operators at one mine have succeeded in reducing this replacement cost to less than one-half that of a new cast iron trunnion.

The accompanying photographs show how the castings are reclaimed. A worn trunnion, as removed from the ball-mill, is shown in the center of Fig. 1. The first step is to cut away the worn section at the point indicated by the arrow. The bottom portion is then machined and beveled as shown at the right in this picture. This salvaged section is now ready for joining to the replacement section shown at the left in the same illustration. The new portion of the casting is 20 in. long by 13 in. in diameter, with a wall $\frac{7}{8}$ in. thick. It weighs about 100 lbs. and is received from the foundry already beveled for welding.

Fig. 2 shows how the two parts are assembled for welding. They are bolted together with a long bolt passed through the center of both castings. Circular plates and crosspieces aid the centering and clamping operations. The end of the bolt at the right rests in a simple support in which it is free to rotate. The circular clamping plate at the left rests across two rollers in



Fig. 1. The worn trunnion (center) is cut at the point indicated by the arrow and the bottom section (right) is beveled for joining to the new casting (left)

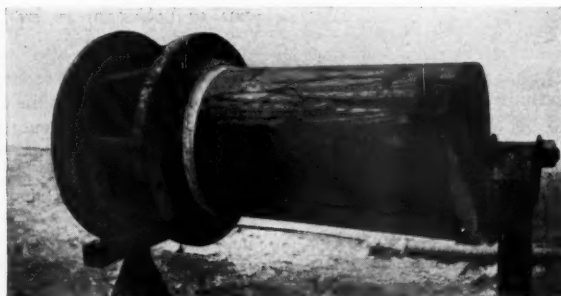


Fig. 2. This jig clamps the two parts firmly together and permits rotation of the assembly during welding

a channel-iron support. The set-up permits the entire assembly to be turned as desired during welding.

After the parts have been set up in the jig they are entirely preheated to a dull red by means of oil burners and then welded. A helper stands by to

turn the assembly so that all welding may be carried on in the most convenient position. Cast iron rod is used, and welding is performed with a No. 10 welding head. Upon completion casting is allowed to cool and the weld is finished by grinding.

Mill Reaching Completion in Pioche District

Completion is expected shortly of a 450-ton lead-zinc concentration plant by the Combined Metals Reduction Company at the Caselton shaft of the Combined Metals Reduction Company

at Pioche, Nev., according to E. H. Snyder, Salt Lake City, vice president and general manager. The plant will cost approximately \$600,000 and is the largest mining development in the Pioche region in many years. The mill will treat ore from the Prince mine of the company, as well as that from the Caselton shaft.

* From Linde Air Products Company.



Charter members of Chapter No. 1, Sigma Tau Epsilon, Rock Springs, Wyo.

THE Union Pacific Coal Company established a new milestone in coal-mine accident prevention on the evening of February 27, when there was organized under the auspices of the company at Rock Springs, Wyo., Chapter No. 1 of the first Greek-Letter Mine Safety Society established in connection with any branch of the mining industry in any part of the world.

The Union Pacific Coal Company enjoys an enviable mine-accident record, suffering one lost-time accident in its nine Wyoming mines for each 114,700 man hours of exposure during the three calendar years 1938, 1939, and 1940, while the bituminous mines in the United States as a whole developed an average of only 15,000 man hours of exposure to each lost-time accident in the same period. Prior to the inception of the company's intensive accident-prevention campaign, the accident toll in its mines was comparable to that of the country as a whole.

The new society, known as Sigma Tau Epsilon, came into existence with 45 charter members, the major number of whom qualified for membership by carrying the mine workers under their supervision for three successive calendar years without a lost-time accident.

The organization will be maintained on a definitely democratic basis. Mine superintendents who receive member-

GREEK LETTER SAFETY SOCIETY ORGANIZED

- *To Promote Safety the Union Pacific Coal Company Originates a Greek-Letter Safety Society, and Organizes Chapter No. 1.*

ship will be without voice or vote, and when any unit foreman, outside foreman, or mine foreman is promoted, he will retain his membership, with, however, loss of voice and vote. No honorary memberships will at any time be accorded higher staff officials.

While the original chapter will be confined to the mines of the Union Pacific Coal Company, any other mining company, coal or metal, which wishes to organize a chapter along similar lines will be privileged to do so, making full use of the society's name, by-laws, etc., which can be amended to meet varying conditions.

Qualifications for Membership as Adopted in Forming Chapter No. 1

The membership in Sigma Tau Epsilon will be restricted to supervisory officials, who have attained a commendable standard of safety in the conduct of their work. The officials eligible for membership are:

1. Mine superintendents who were in general charge of any certain mine which has won or in the future may win the Sentinels of Safety trophy. Members qualifying under this section will not be privileged either to hold office or to vote.

2. Mine foremen who were in local charge of any certain mine which has won or in the future may win the Sentinels of Safety trophy, or who were in charge of a mine in which no lost-time accident was suffered for a calendar year. Members qualifying under this section will not be privileged either to hold office or to vote.

3. Unit foremen who have conducted a section or sections in any mine or mines for three consecutive calendar years without a lost-time accident suffered by any employee working under their direction. Unit foremen who have conducted their section or sections without a lost-time accident for the calendar years 1938, 1939, and 1940 will be eligible to membership in the society. *Members qualifying under this section will be privileged both to hold office and to vote.*

4. Outside foremen who were in charge of the outside men employed in any mine or group of mines to whom no lost-time accident occurred for a period of three calendar years. Outside foremen who have conducted their foremanship without a lost-time accident during the calendar years 1938, 1939, and 1940 will be eligible to membership in the society. *Members qualifying under this section will be privileged both to hold office and to vote.*

5. Proof of eligibility for membership will be taken from the pay roll and accident records of the Union Pacific Coal Company, certified to by the company's auditor and the safety engineer or general manager. No officer other than those covered by Sections 1, 2, 3, and 4, above, will be eligible for membership in the society.

6. General officers of the Union Pacific Coal Company will not be eligible to membership in the society, but any member who may be advanced to the office of president, vice president of operation, general manager, general superintendent, chief engineer or safety engineer will be privileged to retain his membership in the society without right to hold office or to vote. No honorary memberships shall at any time be established by the society.

7. Regular meetings of Sigma Tau Epsilon will be held quarterly in each year at Rock Springs, in the months of February, May, August, and November, at a time and place designated by the president, and there will be elected at the first quarterly meeting of each year a president, a senior and a junior vice president, and a secretary, who will conduct the affairs of the society in a manner approved by the membership, 50 percent of the members who are in the employ of the Union Pacific Coal Company constituting a quorum at any meeting. Special meetings may be called by the president or, in his absence, by a vice president when necessity requires same. Members who leave the employ of the Union Pacific Coal Company will retain their membership but will not be privileged to hold office or to vote.

8. The duties of the president (or in his absence a vice president) will be to arrange a suitable program for each regular and special meeting, to preside over same, and to use his best effort to inspire and promote the work of accident prevention. The secretary will maintain an accurate record of all proposed members, with qualifica-

tions and date of admission to membership, and in addition will maintain a roster of membership and keep a full record of the transactions of all regular and special meetings. No dues will be collected from members and no expenses will be incurred except with the approval of the general manager of the Union Pacific Coal Company.

9. There will be appointed by the president, at the first quarterly meeting in each year, certain committees on safe practice recommendations, each of whom will elect a chairman and a secretary. Each committee will diligently study accident-prevention methods, making due report to the society for approval, amendment, or disapproval of their recommendations; all approved recommendations to be submitted by the secretary to the safety engineer for the consideration of the management of the Union Pacific Coal Company. All committee appointments will be for one year and all vacancies will be filled by the president of the society.

10. The safety engineer will deliver promptly to the proper committee chairman a statement of all accidents that occur within and outside the mines for such recommendations as the certain committee may submit. *It will be understood that the real work of the several committees is to observe bad practice, making recommendations regarding same, thus anticipating and attempting to prevent accidents.*

11. A suitable emblem, to be worn by each member of the society, will be furnished by the Union Pacific Coal Company, upon which will be engraved the name of the member and the year of his admission to the society.

New Sound-and-Color Motion Picture Offered

A new sound-and-color motion picture, "A New World Through Chemistry," has been made by the Public Relations Department of the du Pont Company.

The film interprets, in 20 minutes of narration and ingenious photography, many of chemistry's newest developments. Nylon textile fibers and nylon hosiery, plastics, dyestuffs, "Zelon" durable water repellent, rayon and other chemical contributions to life are shown, the picture tracing their careers from the laboratory through the process of manufacture and into actual use. Part of the action was screened in Hollywood, with professional actors and actresses playing roles.

The picture is offered for club and

school showing through the du Pont Company's Motion Picture Bureau. It may be borrowed either in 16-mm size on an 800-ft. reel or 35-mm size on a 2000-ft. reel. There is no charge except the cost of returning the film.

Deep Shaft to Develop Limestone Mine in Ohio

To supply raw material for the manufacture of chemical products, the Columbia chemical division of the Pittsburgh Plate Glass Company at Barberton, Ohio, is starting to sink two shafts to a depth of 2,250 feet, in order to develop a deep seated limestone deposit. The initial production of the mine is planned at 300 tons an hour. The mine is expected to be in operation within two years. The E. J. Longyear Company, Minneapolis,

will be consultant in connection with the shaft sinking, but the company will do most of the construction work direct.

Only the purest part of the deposit, 40 to 50 feet thick will be mined, and the room and pillar mining method will be used. The company estimates that on this basis the reserves in the deposit will be sufficient for their needs for from 50 to 75 years, at their present rate of consumption.

Picture Furnished By Skilling's Mine Review

The interesting picture, "Contrast, A Modern Lake Cargo Carrier and the Historic Brigantine Columbia," appearing in the February JOURNAL, was published through the courtesy of Skilling's Mining Review.

COAL MINING ON RUBBER TIRES

THE introduction of rubber tires for use on coal-mining machinery is of comparatively recent date, although as far back as 1936 J. H. Fletcher, consulting engineer, of Chicago, originated the use of rubber tires for secondary haulage behind loading machines.

Ever since mechanical loading was generally applied to underground coal mining, the problem of providing efficient transportation behind the loader has engaged the attention of a number of mining men in the study of systems and methods of transportation. If the output of the loading machines was to be increased this problem needed to be solved. Mr. Fletcher decided that a radical change was necessary and that the track would have to be eliminated to provide a modern and up-to-date transportation system behind high-capacity mechanical loading units. Coal mining in open pits where stripping is employed was already discarding the railroad in favor of haulage units mounted on rubber tires, and it occurred to Mr. Fletcher that something similar had to be done underground to provide for the most efficient transportation facilities. Rubber-tired equipment was not available at that time for underground workings, but Mr. Fletcher adapted an industrial tractor and a special-built trailer with drop-bottom doors, and installed a complete unit at Blue Bird Coal Company, Carrier Mills, Ill. This tractor and trailer unit received the coal at the loading machine and transported it a short distance from the face to a hopper and transfer station, where the coal was transferred from the trailer into mine cars operating on track. The tractor and trailer units usually worked in pairs, and sometimes three tractor and trailer units served the loading machine so as to provide as nearly as possible 100 percent transportation back of the loader.

The original system of rubber-tired haulage is often referred to as the "Fletcher Tractor and Trailer System." Additional installations were made at Hart Coal Company, Mortons Gap, Ky.; Moffat Coal Company, Sparta, Ill.; and Wick mine of Ingle Coal Company, Indiana. All these installations have been fully described in previous articles and trade papers;

By E. M. ARENTZEN
Lee-Norse Company

One of the most discussed subjects today in mechanized mining is the development of equipment on rubber tires. The use of rubber-tired shuttle cars behind mechanical loaders is well established. Now cutting machines are being similarly mounted, as well as other equipment for operations at the face. Mr. Arentzen discusses these new developments.

the system was studied by mining men interested in mechanical loading and efficient transportation of coal, and is recognized as the forerunner of an entirely new method of transporting coal underground.

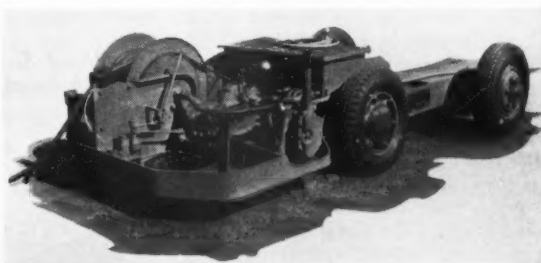
Shuttle Cars

As early as in the year 1922, J. F. Joy designed and built shuttle cars mounted on track wheels for transportation of coal behind Joy 4BU type loader. Later, a similar type of haulage unit known as the coal "Booster" was built and used by Ayershire Coal

idea of using shuttle cars behind mechanical loaders was, however, much revived after Mr. Fletcher proved that rubber tires could successfully be used in underground workings.

In September, 1938, the Katherine Coal Company, of Lumberport, W. Va., installed two shuttle cars made by the Joy Company. These shuttle cars were results of studies made by the engineers watching the Fletcher system, and they differed distinctly from the tractor and trailer units in that they were self-contained vehicles electrically operated by a storage battery and having a conveyor in the

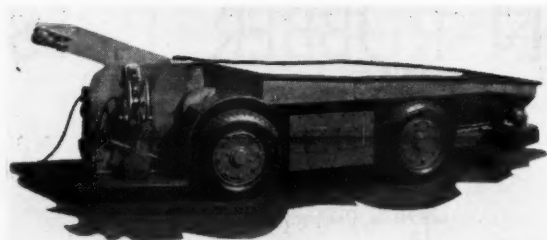
Rubber-tired truck for shortwall mining machine, with mechanically driven cable reel



Company, Oakland City, Ind., behind a mechanical loading machine, and additional units of the same character were built by the American Car and Foundry and used by the same mine.

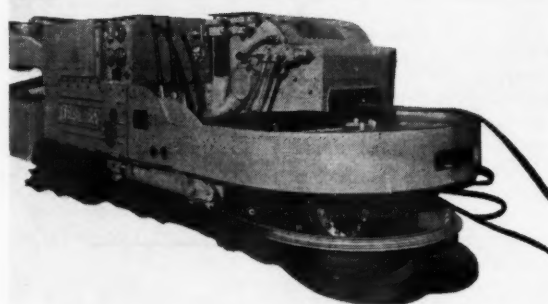
This first attempt at shuttle cars was mounted on track wheels and had a large receiving hopper at one end and a conveyor bottom for unloading the coal. However, the fact that they operated on track limited the usefulness of this equipment to a point where it became doubtful if any improvement was made over the regular locomotive service of mine cars. The

bottom of the car for unloading the coal. This use at the Katherine Coal Company was a great success and became favorably known to a number of coal operating men. Additional installations were made during 1938 and 1939 in high coal seams as well as in low coal seams and under many varied mining conditions. The mechanical and structural difficulties experienced with the shuttle cars were surprisingly few, although a number of improvements have been made in mounting structures and drives, which will be described in this article.



Shuttle car
with discharge
conveyor

Rubber tires are
being applied to
many types of
equipment
underground



The Joy shuttle car consists of a material-receiving body with a conveyor in the bottom and equipped with four rubber-tired wheels. Two of these are driving wheels, with an electric motor for each wheel, and thereby eliminating the use of mechanical differential. The other two wheels are employed for steering and are mounted on an axle, very much like the conventional automotive type. The steering is provided by an automotive type steering wheel, and on the original cars only the front steered wheels had hydraulic brakes.

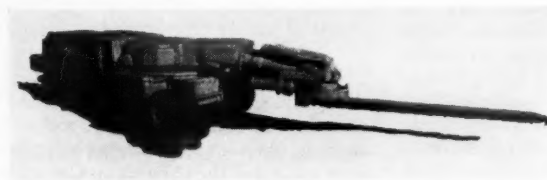
The shuttle car was powered by an electric storage battery 96 V. 48 cells, 300 amp. hour capacity. The conveyor in the bottom of the car served to a certain extent to move the load forward in the car, and to unload the coal into an elevating conveyor which in turn discharged the coal into a trip of mine cars operating on the mine track. The elevating conveyor, sometimes called the "transfer station" or, as some mining men call it, the "inside tippie," is usually located at a convenient point where the trip of mine cars can be loaded. For best operating conditions this station should be not over a maximum of 500 to 600 ft. from the furthest working place. When the territory is worked out to a point where the distance is greater, the transfer station is moved up to a new location. The cars usually serve the loading machine in pairs, but in some extreme cases three cars might be used when the distance of travel is more than 500 ft.

The shuttle car with a conveyor discharge has one advantage over the

drop-bottom trailers; it can handle slate and other roof falls and dispose of this underground without the use of any additional equipment. At one installation the shuttle car helped in clearing roof falls and received the load from one loading machine and disposed of it on the gathering end of the second loading machine, which in turn used the rear conveyor to stack the rock at a much greater height and pack it in an old working place. Handling of these roof falls and great quantity of rock could never have been done except for the particular feature provided in the shuttle car.

Four-Wheel Drive and Four-Wheel Steered Shuttle Cars

In 1938 Mr. Fletcher, together with A. L. Lee, consulting engineer, of Pittsburgh, started to develop a special



Cutting machine
mounted on
rubber tires

rubber-tired vehicle somewhat similar to the Joy shuttle car, but having entirely different drive units, which provided that all four wheels were driven and all four wheels steered. Mr. Lee invented a special self-contained wheel unit consisting of an electric motor, with the necessary reduction gearing, mounted as a self-contained unit with the wheel. These

special wheels were mounted on the car on kingpins that permitted all four wheels to be steered. He also developed other types of driven and steered wheels, where the motor was mounted on the frame of the car, but the type with motorized wheels has become the most popular. This type of shuttle car is known as the "Koal-Mobile" and is now manufactured by the Lee-Norse Company.

The first two of these units were installed at Renton Mine No. 3 of the Union Collieries Company, Renton, Pa., in the early fall of 1939. The Union Collieries Company mines the double Freeport Seam, which has a middle parting approximately 12 to 15 in. thick. This thick parting involves special cutting equipment and special handling of the impurities. The mining system consists of developing 80-ft. blocks by driving 12- to 14-ft. entries and 12- to 14-ft. rooms at 90° angles. The blocks are mined in retreat and under this particular system it is very important that the rubber-tired vehicles be able to negotiate sharp corners; consequently the four-wheel drive and four-wheel steered vehicle was well received for this particular operation. In fact, the mine management at this property had a lot to do with the encouragement of this particular development in rubber-tired transportation units. At this same property, shuttle cars with two-wheel drive, and two-wheel steered, are in operation, but the four-wheel-steered type of vehicle is definitely in favor with the operating men.

The Union Collieries Company is using cable-reel-operated cars, and the transfer station provided for in connection with the Koal-Mobile is mounted on rubber tires and is self-propelled. It is thus possible to move the trans-

fer and elevating conveyor from one location to another during the working shift and thereby keep the distance of travel for the car to a minimum. The unit, in addition to its characteristic drive and steering, also provides unique two-directional control. The car steers and controls in exactly the same manner no matter what direction of travel. The four

motors driving the car permit the use of series parallel control and the car can be run at half speed at the will of the operator.

The cable reel is driven by a Torque motor giving the proper cable tension during the pay-out and increased tension when the cable is wound on the reel. The length of cable is usually 700 ft., but up to 1,000 ft. can be used. The use of two cable-reel cars behind the same loading machine has been satisfactorily solved and presents no further difficulty.

Universal Cutting Machines on Rubber Tires

Union Collieries Company has a number of Oldroyd Universal machines for cutting the middle band between the two coal seams (boney cutting). These machines had to be mounted on caterpillars or rubber tires to meet the conditions for rubber-tired haulage. Two of them were converted from track wheel to caterpillar mounting, but considerable mechanical and operating difficulties were experienced. In the early part of 1940, the Lee-Norse Company undertook to mount one of these cutting machines on rubber tires. The Oldroyd cutter weighs approximately 13 tons and the bar with its universal mounting structure overhangs the tires for a considerable distance.

The conversion of this machine to rubber tires employed the same electric motor drive as for the track wheels, but a differential unit and chain drive to the large driving wheels was introduced. The tires are of special design, 18 ply, and each tire can support a load of approximately 10,000 lbs. Single tires are used on the driving wheels. The steered wheels are mounted on a conventional automotive-type front axle and the steering wheel is of a conventional automotive type, hand operated. The operation of this rubber-tire mounted cutter is considered very successful, and the following pointed advantages are noted:

1. Traveling speed much higher than on caterpillar, approximately 2½ miles per hour.
2. Excellent maneuverability during travel as well as maneuvering at the face and during cutting.
3. Rubber - tire mounting gives much less disturbance to the mine floor.
4. The shock-absorbing quality of rubber tires is of great advantage to the cutting operation and reduces maintenance and shock on the whole machine.

At right: Rubber tired equipment in use underground

Two more Oldroyd cutters have been converted to rubber-tire mounting by Union Collieries Company. In addition to these, the coal company placed an order with the Goodman Company for three new cutters mounted on rubber tires especially suited for cutting the "boney" in the double Freeport Seam.

During last year a great number of mounted cutters have been converted from track to caterpillar mounting by the Joy Company and one of the leading cutting-machine manufacturers has redesigned their universal cutting machine for caterpillar mounting.

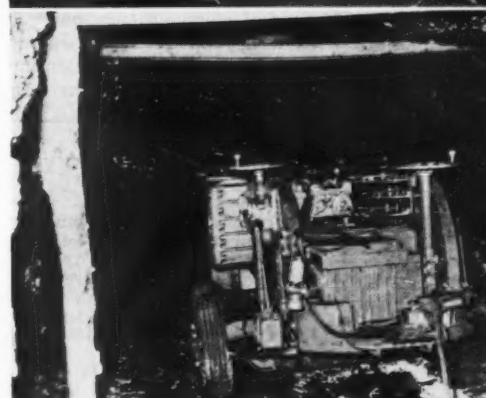
The Lee-Norse Company recently converted a Jeffrey 29U Universal cutter from track mounting to rubber-tired mounting, and this machine is now operating at Jamison Coal & Coke Company Mine No. 9, Farmington, W. Va. A second unit of this type will soon be installed at another mine for the Jamison properties.

Rubber-Tired Trucks for Shortwall Mining Machines

During October, 1940, one special rubber-tired truck for shortwall mining machines was installed at Westmoreland Coal Company's McCullough mine. This truck is of the two-wheel drive and two-wheel steered construction, self-propelling, and having a mechanically driven cable reel. The platform on which the shortwall machine is carried is only 10 in. above the floor, consequently this truck can be adapted for very low seams. This type of truck will be found useful for serving the working area as a supply truck and can be equipped with trolley poles to make it operate in a larger area. Also it will find a number of uses, such as mounting rock - dusting units and mounting of air-shooting apparatus.

Units with High Discharge

In September, 1940, two Koal-Mobile units of a different design were developed and installed at Consolidated Coal Company Mine No. 15, at Mt. Olive, Ill. These have a distinct feature of discharging the coal direct into mine cars without the use of any transfer conveyor. The discharge end has been elevated and an



auxiliary conveyor is mounted directly onto the car. This auxiliary conveyor runs at a considerably faster speed than the main conveyor in the car and the auxiliary conveyor can be adjusted by air lift to a suitable height for reaching over the mine car, or lowered to a position where it will clear the roof going into the rooms. This later development using the "high discharge" unit direct into mine cars enables the cable-reel type equipment to operate to much better advantage, because the point of loading into mine cars can be changed during the working shift to suit the location of the loading machine in the operating area. In other words, it would be possible to shuttle in and out of the room and always get rid of the load at the room neck. However, certain consideration must be given to the passing of the two cars so as to provide the proper service to the loading machine and, therefore, the loading point must be selected in connection with providing a switch opening for the cars.

The use of storage-battery-powered or cable-reel-operated vehicles will no doubt receive considerable attention from the operating men in the next

few years. There are a number of advantages with the use of storage batteries on shuttle cars and also a number of disadvantages. There are a number of advantages with cable-reel-operated shuttle cars as well as disadvantages, but when everything is considered and all local conditions carefully studied, the simplicity of cable-reel-operated vehicles will appeal to most mining men. The further development of the use of trolley poles on rubber-tired vehicles and double trolley wires to provide positive and negative lines will no doubt increase the usefulness of the cable-reel type of equipment. A very interesting study is now being made of means of providing safe and practical operation with trolley poles.

In the few years that rubber-tired haulage has been used in coal mines, it has definitely demonstrated a way to reduce mine operating costs, and has established its economic value; but it is still very much in a development stage and a number of refinements can be expected. In addition, rubber-tired mounting should soon be available on all modern coal-cutting equipment, drilling equipment, and

loading machines. All this will help in providing machinery more efficient and less expensive to maintain and will in the long run effect considerable saving in mine costs.

One of the things that also should be mentioned in connection with rubber-tired haulage is the attitude of the average mining men who operate this new equipment underground. It has been found that in almost every instance where this type of equipment has been installed in coal mines the working men receive it with enthusiasm. One who has been accustomed to operating a mine locomotive and is transferred to the operation of a rubber-tired vehicle will seldom care to go back to the old locomotive. A man who has once been transferred from a track-mounted cutter to a rubber-tired mounted cutter usually dislikes to return to the old method, because he discovers that operations can be accomplished better with the newer method.

The use of pneumatic tires on mining machinery is definitely here to stay and will increase with leaps and bounds as more people become familiar with the great advantages derived.

Bureau of Mines Film Tells Story of Manufactured Abrasives

The story of the invention and development of carborundum is told in a new 16-millimeter sound film recently produced by the U. S. Bureau of Mines in cooperation with an industrial concern. The film is 850 feet in length and requires approximately 24 minutes for showing.

In the film is re-enacted the experiments of Dr. Edward Goodrich Acheson leading to the discovery of carborundum, which was destined to revolutionize grinding and grinding methods. A series of scenes show Niagara Falls and the conversion of its power into the vast electrical energy needed in the manufacture of these abrasives. The furnace room of a modern abrasive plant is also depicted, illustrating the making of carborundum in huge electric furnaces from mixtures of coke, sand, sawdust and salt, and the various processes by which these materials are fused in the furnace at a temperature of about 4,000° F. to make carborundum crystals. The manufacture of aloxite is also shown, made from a mixture of bauxite and coke. The uses of manufactured abrasives are also depicted.

Copies of the 16-millimeter films with sound are available for exhibition by interested groups. Applications should be addressed to the Bureau of Mines Experiment Station, 4800 Forbes Street, Pittsburgh, Pa. No charge is made for the use of the film, although the exhibitor is expected to pay the transportation charges and for loss or damage other than normal wear and tear.

ROUND MESH

Test mesh	Oversize Max.	Undersize		Max. impurities Slate * Bone
		Max.	Min.	
Broken: Thru 4 3/8"				1 1/2 %
Over 3 1/4"		15 %	7 1/2 %	2 %
Egg: Thru 3 1/4"	5 %			1 1/2 %
Over 2 7/16"		15 %	7 1/2 %	2 %
Stove: Thru 2 7/16"	7 1/2 %			2 %
Over 1 5/8"		12 1/2 %	7 1/2 %	3 %
Nut: Thru 1 5/8"	7 1/2 %			3 %
Over 1 3/16"		10 %	5 %	4 %
Pea: Thru 1 3/16"	10 %			4 %
Over 9/16"		15 %	7 1/2 %	5 %
Buck: Thru 9/16"	10 %			12 % ash
Over 5/16"		15 %	7 1/2 %	
Rice: Thru 5/16"	10 %			13 % ash
Over 3/16"		15 %	7 1/2 %	
Barley: Thru 3/16"	10 %			
Over 3/32"		20 %	10 %	

* When slate content on being broken to pea, inclusive, is less than above standards, bone content may be correspondingly increased, but slate content specified above shall not be exceeded in any event and the total maximum impurities shall not exceed those above specified.

New Sizing Specifications Adopted for Anthracite

The Anthracite Emergency Committee at Harrisburg, Pa., recently approved and adopted new sizing specifications for anthracite, replacing those adopted in 1931. The specifications are as shown in the above table.

Boat Trip Planned By Illinois Institute

The twenty-third annual boat trip and summer meeting of the Illinois Mining Institute is scheduled for June 6-7-8, 1941, aboard the S.S. *Golden Eagle*, from St. Louis, Mo.

The program for the meeting is in preparation and will be announced as soon as it is completed.

MILLING SCHEELITE at Tungstar Mine

• Local market for flotation concentrates permits changes in mill practice to raise recovery, with other improvements in the mill flowsheet.

By WALTER B. LENHART
Metallurgical Engineer
Los Angeles, Calif.

THE tungsten deposits in the Bishop, Calif., area can be divided into two classes, (1) those located at comparatively low elevations (4,500 to 5,500 ft.) and (2) those at 11,000 ft. elevation or higher.

Tungsten Mines in the Vicinity of Bishop

In the first class are such operations as the California Tungsten Corporation, locally known as the Black Rock mine; Bishop Tungsten Co., El Diablo mill; Western Tungsten Corporation, Moonlight mine; and the Tungsten City Milling Co. The first-named mine is located in the Schadago Hills, about 30 miles north of Bishop. The others are located in the Tungsten Hills, about 8 miles south and west from Bishop. The Tungsten Hills area was a notable producer during World War I and many of the mines are in the last stages of depletion.

The Black Rock mill is a steady producer. The Tungsten City Milling Co. operates a new wet plant (gravimetric) treating tailings from old Tungsten City mills. Other mills are operated intermittently.

The important producers at present are those mines at higher elevation (Class 2). By far the largest actual and potential producer in this class is the mine of the United States Vanadium Corporation, a subsidiary of Union Carbide and Carbon Co. This company has a 350-ton-per-day mill in operation at the mine and are now constructing a 1,200-ton mill at the

junction of Pine and Morgan Creeks, at an elevation of about 7,600 ft. The mine is at an elevation of about 11,000 ft. and will be connected to the new mill by an aerial tramway.

This company has blocked out large tonnages of a complex tungsten-molybdenum ore. Long and patient experimental work has been carried on to discover the most suitable metallurgical treatment in order to get a good separation of the valuable minerals and at the same time insure high recovery. The problem has been solved by selective flotation, with chemical treatment of the flotation concentrates to bring the tungsten in the final product up to the 60 percent WO_3 range. A chemical plant is located on Pine Creek at an elevation of about 6,800 ft. Concentrates are trucked from the mill to the chemical plant. At this plant flotation concentrates, regardless of what impurity they may contain, are treated to remove all penalizing impurities, and the resulting products contain 60 percent WO_3 or better. Essentially the chemical treatment is an alkaline attack with the final tungsten product an artificial scheelite.

U. S. Vanadium Corp. Plant for Chemical Treatment Will Purchase Flotation Concentrates

One of the outstanding developments in the region has been due to

the inclination of the U. S. Vanadium Corporation to purchase low-grade flotation concentrates from other producers. This is a logical and praiseworthy step in that company's desire to be of assistance wherever possible in increasing the nation's tungsten production and eliminating some of the wastage inherent in plants with gravity concentration.

This development is the primary reason for some of the other producers in the district taking up seriously the possibilities of applying froth flotation to their ores. The first company to take advantage of this new situation was the Tungstar Corporation, whose mine is located on Mount Tom, elevation 11,900 ft., with its mill on Pine Creek at an elevation of 7,200 ft. The two are connected by aerial tramways; i. e., a 3,200-ft. (slope length) jig-back and a 10,500-ft. aerial tramway. The former is at the upper end of the tramway system.

Mine and Tramway of the Tungstar Corporation

The Tungstar Corporation handles a much smaller tonnage than its neighbor, the U. S. Vanadium Corporation, but due to the high grade of ore milled, the tungsten production makes it the second largest producer in the district.

The first mill of the Tungstar Cor-



Lower terminal of the aerial tramway

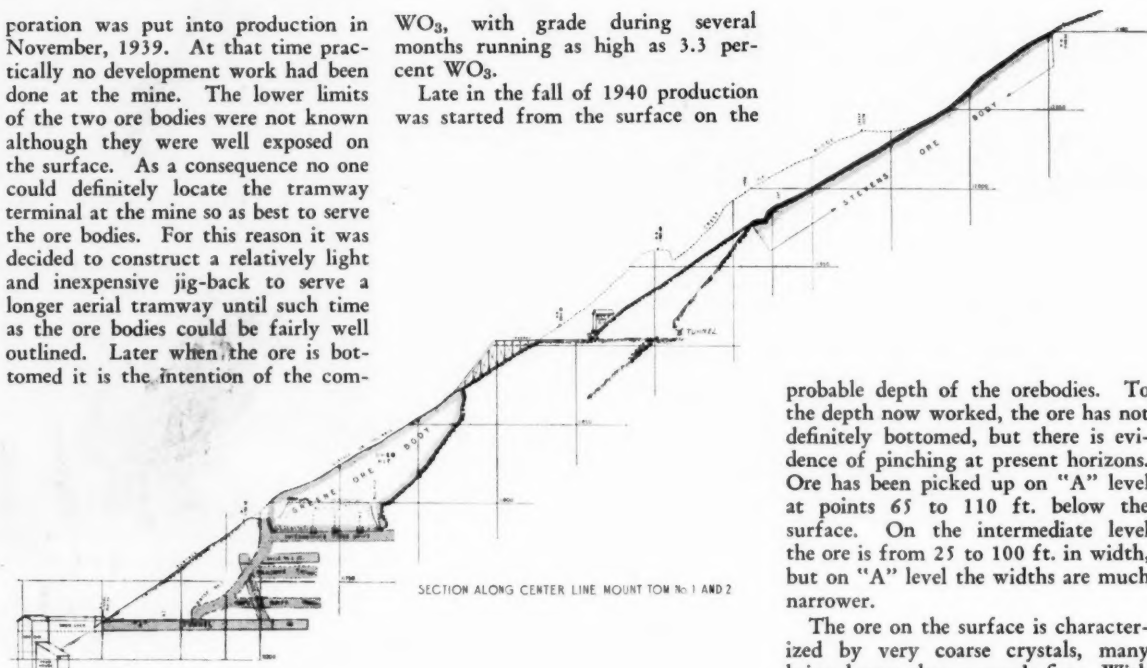
poration was put into production in November, 1939. At that time practically no development work had been done at the mine. The lower limits of the two ore bodies were not known although they were well exposed on the surface. As a consequence no one could definitely locate the tramway terminal at the mine so as best to serve the ore bodies. For this reason it was decided to construct a relatively light and inexpensive jig-back to serve a longer aerial tramway until such time as the ore bodies could be fairly well outlined. Later when the ore is bottomed it is the intention of the com-

pany to extend the present aerial tramway to the mine portals and eliminate the jig-back entirely.

On the claims owned by the Tungstar Corporation are two outcrops of garnetite containing scheelite. The past and current production has all come from the Green ore body. This lense is noteworthy for its high-grade ore and for the purity of the concentrates produced. To date, roughly 17,000 tons of ore have been milled from this orebody, with approximately the same amount remaining partially blocked out. The average grade for 14 months so far has been 2.6 percent

WO_3 , with grade during several months running as high as 3.3 percent WO_3 .

Late in the fall of 1940 production was started from the surface on the



SECTION ALONG CENTER LINE MOUNT TOM No. 1 AND 2

probable depth of the orebodies. To the depth now worked, the ore has not definitely bottomed, but there is evidence of pinching at present horizons. Ore has been picked up on "A" level at points 65 to 110 ft. below the surface. On the intermediate level the ore is from 25 to 100 ft. in width, but on "A" level the widths are much narrower.

The ore on the surface is characterized by very coarse crystals, many being larger than a man's fist. With increased depth, and at certain localities near the surface, the scheelite is fine-grained and would require grinding to at least 48-mesh to liberate.

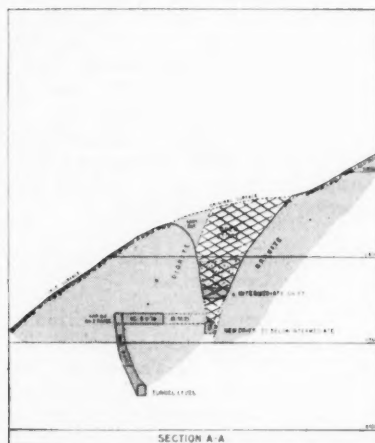
Mine Run Entirely by Contract

An unusual feature of the operations is that the entire mine is run under contract. All ore is paid for at a delivered price per ton at the mill. The tramways, however, are run on company account. Development work, drifts, raises, cross-cuts, etc., are paid for on a footage basis. Contracting the mine was decided on because of the remoteness, and lack of safe transportation facilities for com-

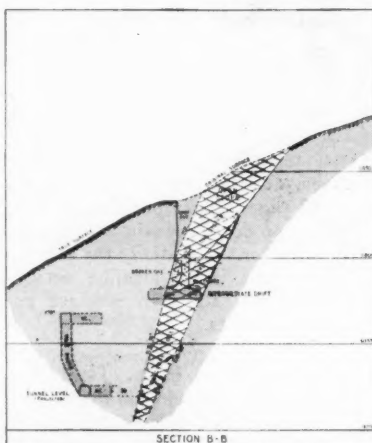
Stevens orebody, but winter soon intervened to stop that work. However, as soon as the weather permits production will again be attempted on that showing. The Stevens orebody, on the surface, is considerably larger in exposed area, but it is expected that the grade of ore will be from 1.0 to 1.5 percent WO_3 . As no work has yet been done to determine the depth of the orebody, no reliable estimate can be made of the available tonnage.

Orebodies Not Yet Tested at Depth

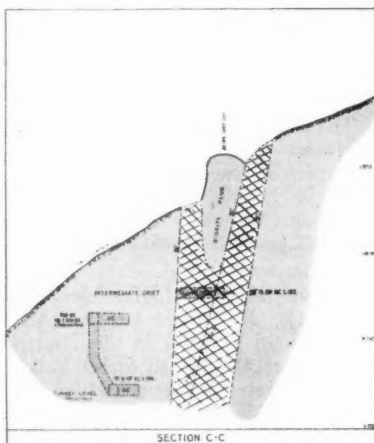
The big question confronting the operators of the Tungstar mine is the



SECTION A-A



SECTION B-B



SECTION C-C

Cross-sections of Greene orebody



Mine staff and guests in a relaxed hour at the mine

pany superintendents. During winter months it is practically impossible to get to the mine except over the tramways. Only maintenance crews are allowed to ride the tramways. The contracting system has been in force since the mine started and so far is working out better than expected. Mr. Joe Bee is the mine contractor.

The ore is relatively soft and a crew of 14 men, using hand steel, have so far been able to keep the mill supplied. A gasoline-driven compressor is now being installed.

Heavy Snowfall Interferes with Mine Operation

During winter months the snowfall at the mill will total 8 to 12 ft. per season, but there is seldom over 24 in. of snow on the ground at any one time. At the mine, however, the snowfall will possibly double these figures, with very little melting until spring. High winds usually accompany or follow the storms, so that most of the snow finds rest in the deep canyons and gorges. Drifts 60 to 100 ft. deep are common near the mine, with the ridges covered only with scattered coatings. Some of the drifts remain for the entire year.

Snowslides in the higher portions are an every-day occurrence, especially in the late winter and early spring months. These slides have not stopped operations for any considerable length of time, although two tramway towers were swept out during the winter of 1939-40. This had been anticipated and material for reserve tower con-

struction was stored at strategic points along the right of way. Replacements were made when necessary, but at the cost of considerable physical discomfort. During the past winter the tramway sky-line on the loaded side broke near the upper terminal, and most of the tramway slid down the mountain side about 3,000 ft. Repairs were made during the month of February, during which period the mill ran on stored ore and on tailings.

During the winter months, because of drifting snow that reaches at times higher than the sky-line on the jig-back, it is necessary to run the jig-back practically continuously to keep open a path through the drifts for buckets to pass. Under such conditions, even though the tram has a pitch of about 30 degrees, it is often difficult for the tram to operate by gravity. This situation is aggravated when mine timber, domestic water, fuel and mine supplies have to be sent to the mine. To overcome this handicap, a gasoline engine is being installed at the upper end of the jig-back assembly in such a fashion that it can be used when necessary, yet when the weather is fair the tram can be run by gravity alone.

First Mill Replaced by a Larger, More Efficient Plant

The first mill of the Tungstar Corporation was built during 1938-39 but did not go into production until November, 1939. It had a capacity of 40 tons per 24 hours. Mechanical troubles developed and, as a result, the mill had an operating time of about 55 percent. Notwithstanding this drawback, it was able to operate at a profit.

In June, 1940, the company decided to build an entirely new mill, and a contract for construction was given to the Western-Knapp Engineering Co., of San Francisco. This mill was



Mill building; Mt. Thom in background

placed in operation September 10 of last year. All equipment was new, and only tables were used for recovering the scheelite, with rolls and a rod mill as the grinding equipment.

The flowsheet of this new mill was designed on the principle of "crack it, screen it; crack it, screen it," etc. Thus as soon as the scheelite was liberated it was tabled out, by means of eight Wilfley tables. Careful sizing with screens and cones was practiced so that each table received a sized feed. Middlings were returned to a separate table.

With the exception of the rolls, the new mill has worked out very well mechanically. Practically all of the lost operating time has been due to roll trouble—shells slipping on cores, necessity of rebabbiting bearings, etc. In the newer plan, using flotation, there will only be one set of rolls in operation at a time, with the other set in reserve. From a metallurgical standpoint, using 100 percent gravimetric methods of recovery, the rolls caused far less slime losses than any piece of grinding equipment tried.

A novel feature is the roll drive. This consists of a geared-in-head motor

Ore feeder
to rolls

for the smaller driven pulley on the rolls, and a second standard-speed motor on the larger pulley. The two roll shells run at the same speed. Each motor is belted to each roll by suitable "V" belts. This has worked out well on the fine rolls. On the primary rolls the shocks due to occasional pieces of coarse ore caused trouble with the gears in the geared-in-head motor.

Steps are being taken to correct this, using "V" belts with 10-ft. centers.

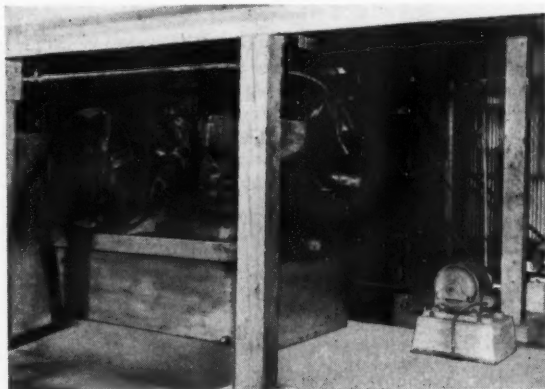
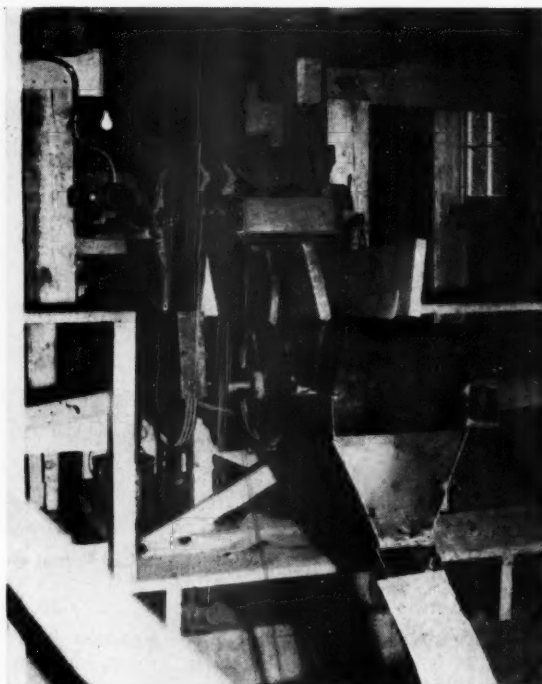
The losses in a gravimetric plant are due to: (1) minus 150-mesh scheelite, or finer, which is not caught on the tables; (2) non-liberated scheelite in the coarser sizes. Grinding to finer sizes to reduce losses from cause (2) increases the losses in (1).

Flotation to be Added, and Flotation Concentrates Sold

With these metallurgical losses in mind, and with knowledge of the fact that the United States Vanadium Corporation would purchase low-grade flotation concentrates, experimental work of extensive scope was undertaken. After preliminary laboratory tests, a 6-cell, semi-commercial flotation unit was installed. This unit could handle about 5 tons of raw feed per 24 hours.

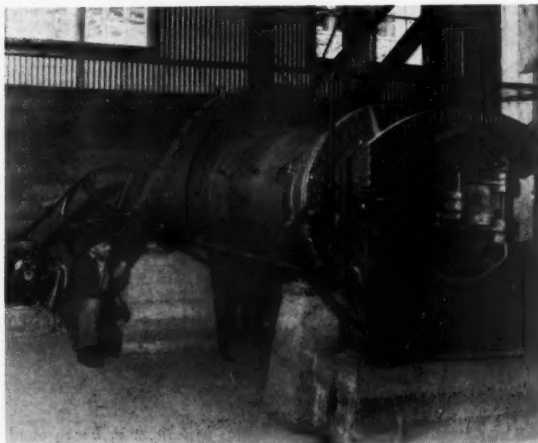
Early in December, 1940, orders were placed for flotation cells and other equipment. It is expected that the flotation plant will be in operation this spring. The flow of ore through the new set-up is planned so that a reasonably high recovery will be made on the tables. The final grind in the rod mill will be to at least 48-mesh. This will possibly reduce the scheelite to minus 150-mesh, as there is a decided preferential grinding. After tabling over the eight tables, each with a classified feed, the tailings will be thickened and floated, as shown on the accompanying flowsheet.

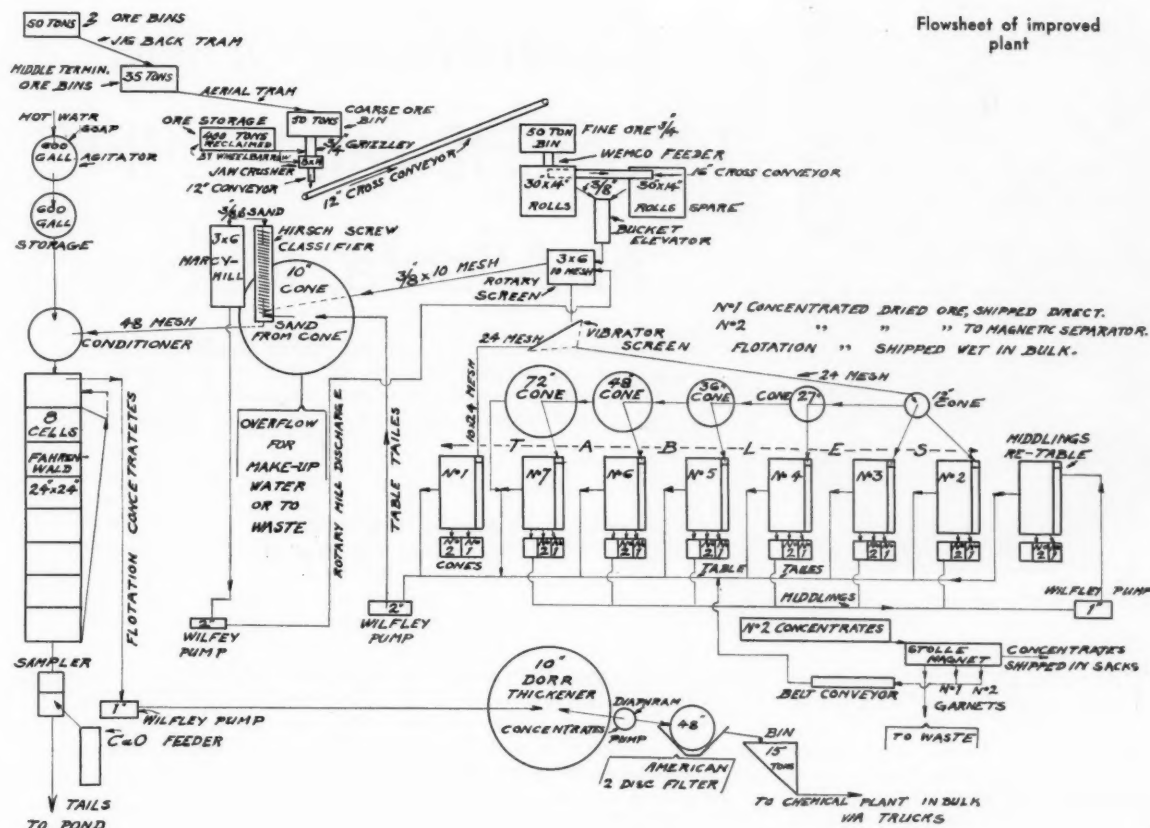
This scheme will give three different concentrates; (1) a high-grade table concentrate that is dried, sacked, and shipped without further treatment. Heretofore this concentrate has run 70 to 72 percent WO_3 . (2) A lower-grade table concentrate,



Above:
Rolls with
separate motor
for each shell

Right:
3 x 6 Marcy
mill





which averages around 20 percent WO_3 with garnetite and garnets as the dilutant. This is dried and passed over the magnetic separator. A concentrate with a content of 60 to 65 percent WO_3 results. The recovery of the magnet is 97.5 percent or better, and all rejects from the magnet are returned to the grinding system via a small belt conveyor. (3) A flotation concentrate that will be in the 15 to 25 percent WO_3 range; and this, as previously mentioned, will be sold locally.

Tables Still to Make Bulk of Concentrates, with Flotation as Scavenger

Under normal marketing conditions it is desirable to make as much table concentrate as possible, for when scheelite is quoted at \$24 per unit, the lower grade flotation concentrates will bring from \$18 to \$20 per unit, depending upon the grade and amount of penalizing impurities in the concentrate. For this reason, the mill is designed to get first all the high-grade concentrates possible, and use flotation as a scavenger.

Using the two rolls and the rod mill before flotation, recovery would depend on the character of the ore. When running the mill on coarse, crystalline (scheelite) ore the recovery would be from 70 to 80 percent, but when the ore, as finally ground, is milled the recovery would drop to 50 and 60 percent. If one roll cut out of the circuit (leaving one roll and rod mill to do grinding) more scheelite would be going to the rod-mill circuit and recovery could be depended upon to drop from 10 to 20 percent below these figures. With flotation, the mineral in the minus 150-mesh and true slimes is the easiest of all to recover. For that reason, use of one roll in the new set-up is not expected to alter the final result, and over-all recovery will be 92 to 95 percent.

Other Mill Changes

Some of the changes to be made in the mill are: The two single-decked vibrating screens will be removed and replaced with a Hirsch, screw-type classifier. This is a classifier of the Akins type with some improvements that are expected to give a closer

sizing. The classifier will be in closed circuit with the rod mill. Only one roll will be used, with the second for a spare.

Eight Fahrenwald 24-in. by 24-in. flotation machines will be installed, with one large Denver reagent feeder for soap solution, and three Clarkson reagent feeders for other reagents. A 10-ft. Dorr thickener and a 2-disc American filter will be employed for filtering the flotation concentrates. The concentrates will be shipped in bulk and wet.

The reagents will be as follows:

	Lbs. per ton of ore
Oleate chips (soap).....	1.0 to 1.5
Sodium silicate.....	.25 to 0.4
Emulsol B.....	.1
Cresylic acid.....	.1

Hydrated lime will be added to the final tailings after sampling, to settle slimes and precipitate any soap left in solution.

The offices of the Tungstar Corporation are at 6233 Hollywood Boulevard, Hollywood, Calif. P. N. Stevens is general manager; W. B. Phelps, consulting engineer; and J. Denman Jones, chemist; A. J. Anderson is tramway superintendent.



Talache Mines has beautiful surroundings

Operations of the TALACHE MINES, INC. at Atlanta, Idaho

The company has taken over and pushed development of several old properties, some of which were formerly thought to be completely worked out, and has become the largest producer of gold in the state of Idaho.

By JOE H. SKIDMORE

General Superintendent
Talache Mines, Inc.

TALACHE Mines Atlanta operations are located near the town of Atlanta, Idaho, in Elmore County, about 60 miles by air east-northeast of Boise. In 1936, the Forest Service completed a road to Atlanta, making it possible to drive to the mine, from Boise, along a water grade that follows the main Boise River and its middle fork for the full distance. Such a road, being easy to maintain in winter, has made the camp accessible by car the year round.

History of the District and Production

The lode deposits of the Atlanta district were discovered by placer miners in 1864. The ore was extraordinarily rich in silver and gold, and soon became widely known. The Buffalo mine, which marked the site of the original discovery, and its adjoining neighbor, the Monarch, both on the Atlanta lode, were first in development and production.

The Pettit (subsequently the Bagdad-Chase and Boise-Rochester operations), also on the Atlanta lode and joining the Monarch on the east, was later placed into production. Several mines, such as the Last Chance, Minerva, Tahoma, etc., discovered on lateral veins oblique to the Atlanta lode, were also quite productive.

During the early days the ore from the upper workings of the Buffalo and Monarch mines was so rich that it was profitable to sort the high-grade and send it by pack train to Rocky Bar, and by bull team to Kelton, Utah, the

nearest railhead, 230 miles away, for shipment to smelters and refineries in New Jersey and Omaha. Much of the ore netted between \$700 and \$800 per ton in gold and silver; one shipment of 40½ tons yielded over \$160,000. Because shipping costs were prohibitive on the lower grade ores, various kinds of milling plants were installed, from arrastras to modern amalgamation-flotation plants.

Mining activity ceased about 1880 after one previous slump, and did not revive until 1900, when the district entered its third major boom. The Monarch was reopened in 1902, completely rehabilitated by 1906, and had its new amalgamation, concentration, and cyanidation plant in operation by 1910. Although this was a large modern mill for its day, nevertheless the mill and mine closed down after the mill had operated for two months and treated 4,200 tons of \$7.35 ore (old price of gold) during October and November, 1910. The method of treatment was not economical because:

Average value of heads.....	\$7.35
Average grade of concentrates...	\$85.00
Recovery	57%

The Pettit property was taken over by the Bagdad-Chase, and its new amalgamation and cyanidation mill was operated from 1908 to 1911, making this property the largest producer in the district for the period. This boom ended in 1911.

In 1915 the camp revived when the Boise-Rochester, which had taken over the Bagdad-Chase, located the important Old Chunk, east-end ore body on

the 500 and 600 levels. In 1917, about the time the Old Chunk orebody was worked out, the St. Joseph Lead Co. purchased the property.

The St. Joseph Lead Co. did considerable development work and constructed and placed in operation a modern amalgamation-flotation plant in February, 1932. From 1932 to 1936 the property was the leading gold producer in the state. Operations were suspended in the spring of 1936, after exhausting the known orebodies of the Boise-Rochester and Monarch properties. Records of production are incomplete, but the total production



Ore face in 270 stope, "Old Chunk" ore body

has been estimated to exceed \$6,000,000 from 1864 to 1936. The production from 1932 to 1936, inclusive, was approximately \$2,500,000.

Properties Taken Over in 1936

Talache Mines, Inc., purchased the Boise-Rochester mine in 1936, despite the view held by many that the town of Atlanta was destined to be a "ghost camp" due to the fact that there was no ore left in the hill. That was not a bright prospect, but there is now concrete evidence that ore does exist, in commercial quantities, in the Atlanta hill.

The preliminary examination made of the Boise-Rochester property on July 3 and 4, 1937, was rather disheartening. The main haulage levels were in disrepair, the track that remained was of 12-lb. rails and badly worn, and many of the important drifts, crosscuts, and raises were either inaccessible or caved. An idea of the cost of repairing the mine and maintaining same in a workable condition is given in the following tabulated costs:

Period	Cost
Development period, Sept., 1937-Sept., 1938.....	\$8,485.00
Year 1939	37,402.00
Year 1940	80,000.00
Total cost for mine repairs to date	\$125,887.00

The excessive underground repairs cost, which for the year 1940 has averaged \$6,700 per month, is directly attributable to the heavy, swelling nature of the Atlanta lode. It is nothing uncommon to be required to relieve and repair a drift or stope sill, in the main shear zone, as often as every 60 to 90 days.

Many reports had been circulated concerning mill ore left in the stopes, and of the high-grade gobbled, but in all the places where old backs have been sampled or old gob prospected, no commercial ore has been found. One exception is the 1,450 cave area, directly above the 1,450 level. The previous operating company opened up a square-set stope, 125 ft. long and from one to six sets wide, a few feet above the 1,450 sill, but failed to hold the ground and lost the whole block. Later a raise was put through this cave and the ore worked above the caved area as two separate, narrow stopes. From this caved ore and another high-grade narrow stope on the 900 level, plus some lessees' ore, Talache Mines shipped 367 tons of crude ore, netting approximately \$40,000 during the development period, September, 1937, to September, 1938, in

In the 270 stope, above 900 level



addition to mining and storing in stock piles, several thousand tons of milling ore, averaging approximately \$12 per ton. This 1,450 caved area, which required two years for mining 95 percent of the available ore by the square-set receding method (without injuring a man), plus two stopes on the 900 level and one on the 750 level, supplied all the ore mined and milled from September, 1937, to November 1, 1939.

On that date Talache Mines, Inc., purchased the Monarch, Buffalo, and Last Chance properties. Since then production has been maintained from the Boise-Rochester, Monarch, and Buffalo properties. Old gob prospected and developed in the latter two properties has carried sufficient value in gold and silver to justify mining and milling. This gob, averaging from \$5 to \$20 per ton in gold and silver, is mined along with the marginal ore left on either side by the old timers. No difficulty has been experienced in removing this filling because, generally, it has been compressed to practically a solid mass due to the swelling nature of the Atlanta lode.

In order that one may appreciate the progressive steps taken from the fall of 1937, when all drilling and tramming was done by hand, to December 31, 1940, and increase in scale of operations to over 300 tons per day, the following data are submitted:

Period	Dry tons milled or shipped	Gross sales gold & silver
Development period:		
Sept., 1937-		
Sept., 1938.....	367	\$38,573.00
Oct., Nov., Dec., 1938	7,939	63,848.00
Year 1939	41,625	357,200.00
Year 1940	79,119	669,708.00
Totals.....	129,050	\$1,129,329.00

This property was the largest producer of gold in the state for 1940.

Description of Ore Bodies

The Atlanta lode, striking N. 45-65° E. and varying in width from 30 to 150 ft., has been traced on the surface for more than 2 miles, and lies in granitic rocks related to the Idaho batholith. The batholith has been so thoroughly and repeatedly shattered by crustal movement that blocks of unfractured granitic rock, more than a foot square, are difficult to find. The main zone of shearing is occupied by the Atlanta lode, and the related, but subordinate oblique zones of fractures, contain the lateral lodes on either side. The laterals, some of which are older (800 Split) and some younger (270 Split), strike from S. 65° W. to N. 70° W. Apparently some of the laterals or split veins have nothing to do with the ore in the main shear zone, and again evidence is conclusive that the laterals governed the enrichment of the ore found in



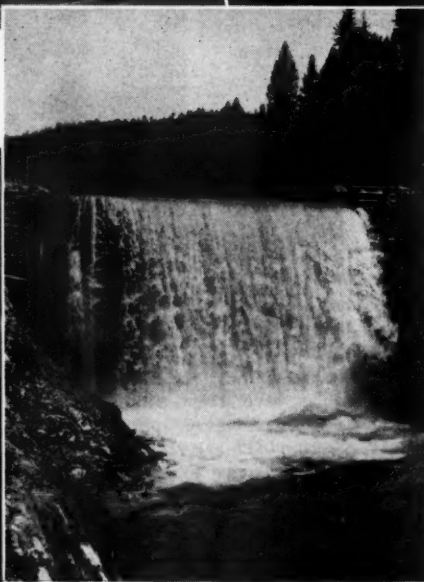
Mancha locomotive at portal
of 900 level



Loading sacked concentrates for
shipment to Boise



300-hp. diesel, direct connected to
250-k.v.a. generator



"Kirby" Dam on the middle
fork of Boise River



Penstock in "Kirby" hydro-
electric plant



Talache mill—winter, 1939-40



One of the hydroelectric plants

the Atlanta lode. The former operating company overlooked much commercial ore by disregarding the importance of such splits. This is especially true concerning the downward extension of the "Old Chunk" ore shoot below the 600 level, which was condemned as barren. Since April, 1939, this "Old Chunk" zone under the 600 level has developed into the richest stope recently worked in the mine, having a strike length of 325 ft. on the 900 level and 550 ft. on the 750 level. At times this ore shoot has been required to produce in excess of 150 tons per day, while other areas were developed. Nevertheless, this stope is still producing and has many months supply of ore in sight. The 270 Split, first discovered on the 900 level in one of the old headings, is a split much younger than the main shear zone and the key to the "Old Chunk" mineralization.

Although the ore shoots differ radically in gold and silver value, extent, etc., nevertheless they all conform more or less to the precious-metal epithermal type; that is, deposits formed near the surface by ascending thermal waters in genetic connection with igneous rocks. The deposits consist largely of fine to medium grained brecciated quartz, containing finely crystalline arsenopyrite and pyrite. Some of the gold is free but the larger part seems to be intimately associated with the sulphides, especially pyrite and chalcopyrite. Silver occurs chiefly as complex silver antimonial or arsenical sulphides, although native and horn silver are quite abundant near the surface. Native silver and gold, also electrum have been found to depths of 800 feet or more.

In the vicinity of the Monarch shaft, which is located near the center of the Atlanta lode mineralization, there is a very complex localization of ore shoots. The ore on the north wall, known as "B" stope, characteristically black in color, lying on the contact of the shear zone and granite north wall, is heavily brecciated and has been developed laterally on the 100 level for 800 ft. east of the shaft. "B" ore is uniformly good in gold value but carries very little silver. "C" stope ore, which lies 20 to 30 ft. south of "B" ore, makes in a brecciated quartz zone, striking almost parallel to "B" ore shoot. "C" ore contains almost equal value in gold and silver with the silver minerals composed chiefly of complex silver sulphosalts. The antimonial silver sulphides pyargyrite, commonly known as dark ruby silver, and stephanite are the more common. The third ore zone lying farthest

south in the main shear is known as "D," or southwall ore. On the upper levels this ore is like "C" in that the silver value is as important as the gold, and at times the silver value predominates. Dark ruby silver sometimes occurs as massive lenses of almost pure mineral from a fraction of an inch to 6 in. wide. These hot spots, however, seldom occur for more than a few sets in length, or far in vertical extent. "C" ore converges into "D" or southwall, east of the shaft, and then the combined "C" and "D" mineralization converges with "B" stope ore about 500 ft. east of the Monarch shaft.

Tungsten Found in the Buffalo in Commercial Quantities

The Buffalo ore is similar to the Monarch and usually lies either on the north or south wall or a combination of both. The main shear zone narrows down rapidly near the Buffalo shaft and shows indications of the two ore zones merging into one mineralized area. The chief interest, other than gold and silver in the Buffalo ores, has been the discovery, in commercial amounts, of the tungsten mineral scheelite. One stope, although relatively small, proved to have more value in tungsten than the gold and silver being recovered. This block of ground has been partially developed and will not be worked until more prospecting is done to ascertain further the tungsten possibilities.

The Boise-Rochester ore shoots are chiefly confined to one mineralized zone lying on either wall or between the walls. However, the Pettit ore shoot, which lies mutually on Boise-Rochester and Monarch ground, has, in part, a northwall and southwall ore-body that in places merges to make one ore zone.

The Atlanta lode's chief production has come from six ore shoots, named in order from east to west: Old Chunk, Central, Pettit, Monarch, Buffalo, and Yuba. At the present time, ore is being produced from the Old Chunk, Pettit, Monarch, and Buffalo shoots. The shoots have an ore width from 2 to 30 ft., averaging 6 ft., a length of 200 to 800 ft., and many have a vertical range of 100 to 800 ft.

Methods of Underground Exploration

Prospecting and exploration is carried on by the combination of drifting, crosscutting, and raising. The usual procedure is to carry the main haulage adits in the north or south wall to avoid the heavy ground of the

main shear. When developing an ore shoot on a level, the common practice is to drift on the strongest ore zone and crosscut through the shear zone to the opposite wall at regular intervals to ascertain other ore possibilities. Because most of the rock penetrated in the Atlanta hill is heavy and swelling, all crosscuts and drifts are timbered with extra large, seasoned, native fir timber, cut locally. All sets are framed with 4-ft. caps in the clear and posts are 7½ ft. overall. Each post is battered a full 18 in. and rests on a solid matting of planking, at least 30 in. square. When the drift bottoms are too soft to support posts with the above footings, a segment sill is used, making an angle of 90° to 120° between the segments, or approximately a minus 30° to 45° angle to the horizontal, the angle between the segments being governed by the softness of the formation. Under the lowest point of each segment sill, a solid matting of planking is laid to provide the necessary bearing surface.

Details of Sampling and Stopping

All normal, daily samples are taken by the shifters. This method of sampling has made it possible for each face to be sampled each shift. Channel samples are cut with a prospecting pick and caught in canvas catch-alls of local design. The average sample taken weighs about 10 lbs. Car samples are taken for all chutes, ore pockets, and development headings.

The stopping method first used was chiefly standard cut and fill, using stulls to support heavy slabs. This method was completely eliminated in the spring of 1939 because it was considered too hazardous in blocky, sheared granite. By the summer of 1939, all the stopes had been converted to standard square sets for the wider ore bodies, and a leaning half set for the narrow, flat-dipping sections. Square sets are the regular Butte 2-in. step frame, which are very flexible since posts and caps are interchangeable. Although this frame is rather expensive to make by hand with Skilsaws, nevertheless the advantage of the extra strength, for side-pressure ground, is more than justified in these stopes. All chutes and manways are placed at 40-ft. centers. Stopes must be filled and filling is derived from waste raises and exploration waste.

Underground Transportation

All loading and upper level tramming is done by hand. Ore from the

Monarch and Buffalo levels is transferred to the 600 haulage level through ore passes and thence into large ore pockets. A 2½-ton storage-battery locomotive, hauling ten 20 cu. ft. mine cars, transports this ore 2,000 ft. to R-3 transfer raise, through which same is dropped to the 900 level R-3 transfer ore pocket. A 3¼-ton storage-battery locomotive, pulling twenty 23 cu. ft. mine cars, transports the ore from there 3,400 ft. to the mill bins. Both locomotives gather ore from other stopes and take care of all waste from exploration. Waste from the Monarch and Buffalo levels is trammed directly to surface dumps or hoisted to the surface, when not used for stope filling.

Ventilation is by Natural Means

All ventilation is natural, entering through the four adit levels and passing up the various raises and main Monarch shaft to the upper workings. All dead-end drifts, raises, or stopes are ventilated by 8-in. and 10-in. compress-air-driven fans, using a flexible ventilating tubing. A combination of compressed-air blowing and water spraying is used to eliminate dust in all working places.

Mining Costs

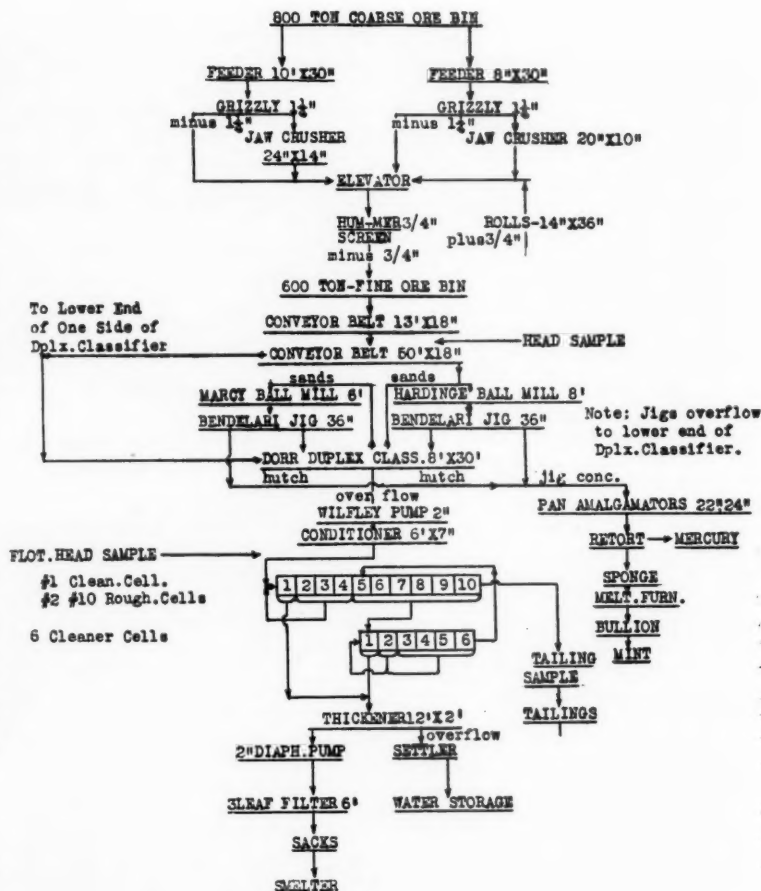
The following mining costs are complete, including overhead, depreciation, surface expense, administration, mine repairs, and exploration:

Period	Dry tons mined	Cost per dry ton
1939.....	41,625	\$4.48
1940.....	79,119	4.70

The increase in cost per dry ton of ore produced in 1940 over 1939 was due chiefly to the excessive expense for mine repairs. During 1940 the Monarch and Buffalo properties were made workable, which required the repairing and retimbering of most of these old drifts and crosscuts. The Monarch shaft and respective stations were reconditioned from the Boise-Rochester 600 level to the surface. About half of the shaft timbers were replaced or repaired and the shaft collar concreted for a distance of 10 ft. vertically.

Mill Has Been Rehabilitated and Enlarged

The present mill building is the one built by the St. Joseph Lead Co. in 1931 and 1932. In June, 1938, the present company rehabilitated the structures by placing new foundations where required, general repair, adding additions, and covering most of the old roofing paper with Celotex insula-



Mill Flowsheet of 300 ton plant of Talache Mines Inc., Atlanta, Idaho.

tion and corrugated galvanized iron roofing. The mill, a modern amalgamation-flotation plant, using one 6 by 6 Marcy grate mill for fine grinding, was placed in operation September 27, 1938. The month of October, 1938, 2,684 dry tons were treated for an average of 86 tons per 24 hours for the full month. By December, 1939, the production had been increased to 4,449 dry tons, or an average of 143 tons per 24 hours. The month of April, 1940, the single unit mill treated 4,745 dry tons for an average of 160 dry tons per 24 hours. An average tonnage of 160 tons per 24 hours was considered very good for a single 6 by 6 Marcy grate ball mill, handling minus ¾-in. quartz ore and grinding to 53 percent minus 200-mesh. The secret of the good results obtained is partially due to the method of sending the crude ore to the ball mill. All the minus ¾-in. crude ore, and at times minus 1½-in. feed when

the ore was talcy, went direct to the lower part of one side of a Dorr 8-ft. by 30-ft. classifier, where it was washed of all fines and slimes before joining the normal circulating load of the classifier. With one mill, only half of the classifier was used. This arrangement, whereby all the crude ore was washed and freed of all wood pulp and chips from the mine, was not according to the "Book of Hoyle," nevertheless it proved to be a life-saver for this particular job. At one time minus 1½-in. coarse ore was fed to the classifier for more than 30 days and experienced no undue wear on the classifier bottom, because the rakes were raised sufficiently high to make a deep bedding on the classifier floor.

During the winter of 1940 ground was blasted and excavated within the mill building to allow room to install an 8-ft. by 22-in. Harding ball mill in parallel with the Marcy. Concrete walls were poured in sections to sup-

port the mill building and 500-ton fine-ore bin, necessary equipment forms and floors were completed, and equipment was installed ready to operate by the last of May, 1940. The production for June, 1940, was 7,811 dry tons, or 260 tons per day. October, 1940, production was 9,247 dry tons, or 300 dry tons per day. The accompanying flowsheet is self-explanatory as to operating practice.

Testing Carried On to Better Mill Recovery

Mill results were very good from the day operations started in 1938 to March, 1940; tailings averaging less than 0.02 oz. Au per ton, and some months as low as .012 oz. As soon as Monarch and Buffalo ores were treated, the tailing losses began to climb until in November, 1940, they averaged 0.093 oz. Au per ton. So far this year, 1941, tailing losses have averaged 0.042 oz. Au per ton. From August, 1940, to the present time, hundreds of metallurgical tests have been conducted to effect better recoveries. The services of several well-known metallurgical firms have also been employed in an effort to obtain more economical results.

Numerous reagent combinations and special flowsheets have been actually conducted in the regular mill circuit to check laboratory test work. None of these changes have improved the metallurgical results economically, except the cyanidation of final mill tailings. The following flowsheet and reagent combinations have been tried out in the mill circuit for periods of 1 to 15 days:

1. Slime dispersion with starch and sodium silicate in an alkaline circuit, using soda ash or caustic soda to obtain alkalinity.
2. All acid circuit, using H_2SO_4 with and without Reagent 239.
3. All alkaline circuit, using varying amounts of soda ash and caustic soda.
4. Two circuits, acid and basic; also basic and acid, independent of each other.
5. Barium sulphide with and without an acid circuit.
6. Sodium dichromate added to ball mill or conditioner.
7. Reagents 208, 239, 404, Minerec "A," and fuel oil used with varying amounts of standard reagents.
8. Cleaning independently of regular circuit and tabling cleaner tails to eliminate from the circuit a middling build up.

MILLING DATA AND TOTAL COSTS

Period	Dry tons treated	Heads value Au & Ag	Tails value Au & Ag	Cost per dry ton		
				Milling costs	Mining costs	Total costs
1939 and 1940	120,744	\$9.85	\$1.42	\$2.10	\$4.60	\$6.70

Power Requirements and Power Plants

Power requirements for the total job, based on an average 24-hour period, vary from 450 to 500 hp. when milling in excess of 300 tons per day. Peak loads will at times exceed 700 hp. During the high-water months, March to July, the hydro-electric power plants generate sufficient power for all mining and milling requirements. During the winter freeze-up period, the following hydro-electric and Diesel plants are required to maintain full production:

Hydro-electric Installations:

1. Kirby Power Plant comprising two Sampson horizontal, double-runner turbines activating two Westinghouse 180-kw., 3-phase, 60-cycle, 2,300-volt, 514-r.p.m. generators.
2. Atlanta Power Plant comprising one Pelton bucket water wheel activating one Westinghouse 125-kw., 3-phase, 60-cycle, 2,300-volt, 900-r.p.m. generator.
3. Boise-Rochester Power Plant comprising one 20-in. Trump single-runner turbine activating one Allis Chalmers 150-kw., 3-phase, 60-cycle, 2,300-volt, 900-r.p.m. generator.

Diesel Installations:

1. Fairbanks-Morse 300-hp. Style Y, Type V, 257-r.p.m. engine direct connected to General Electric 250-kv.a., 3-phase, 60-cycle, 480-volt generator.
2. Caterpillar D17000, 8-cylinder, 160-hp. engine direct connected to General Electric 90-kw., 3-phase, 60-cycle, 480-volt, 900 r.p.m. generator.
3. Cletrac DD 50 tractor belt connected through power take-off to 50-hp., 3-phase, 60-cycle, 440-volt, 1,200-r.p.m. induction motor. This

unit is excited by the excitation of the other Diesel engine exciters, and is overspeeded to around 1,220 r.p.m. to give slippage, hence acts as a generator. This is a rather novel set-up, but is good for 40 to 45 amps, at 440 volts, or approximately 50 hp. It is questionable whether there is such a generating plant in operation elsewhere in the state.

Personnel:

The operating personnel consists of the following:

A. H. Burroughs, Jr., president and general manager; Joe H. Skidmore, general superintendent; Arthur A. McLeod, mine superintendent; J. N. Groomer, mill superintendent; William Settle, mine foreman; Arnold I. Rumsey, accountant.

Acknowledgments:

The author wishes to acknowledge the use of information derived from Idaho Bureau of Mines and Geology Pamphlet No. 49, "Geology and Ore Deposits of the Atlanta District, Elmore County, Idaho," by Alfred L. Anderson.



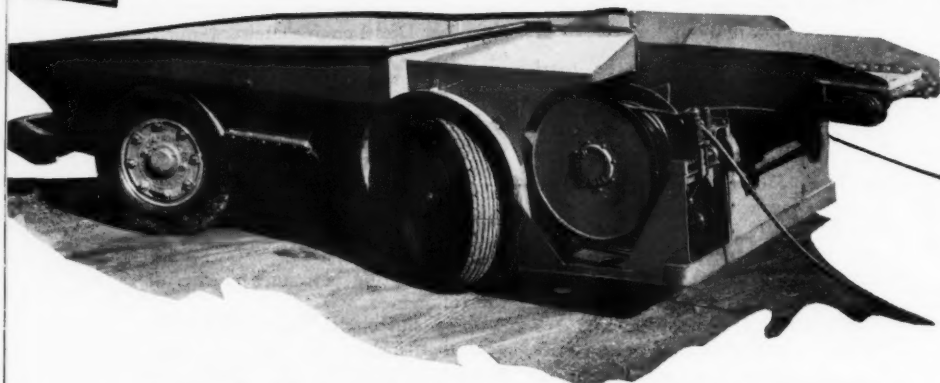
Upper: Loading car from transfer raise, 900 level



Right: Drilling in flat stope

EXHIBITED *at* COAL SHOW

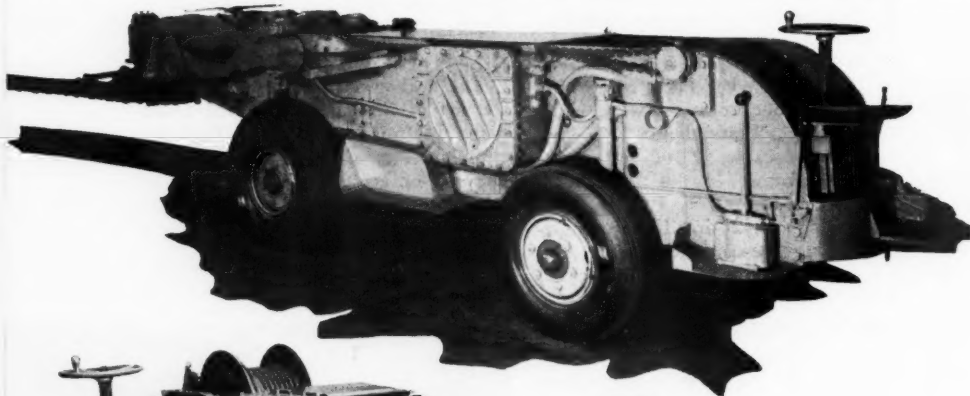
BOOTH Nos. 135-37-39-41-43-45



LOADS DIRECT INTO MINE CAR

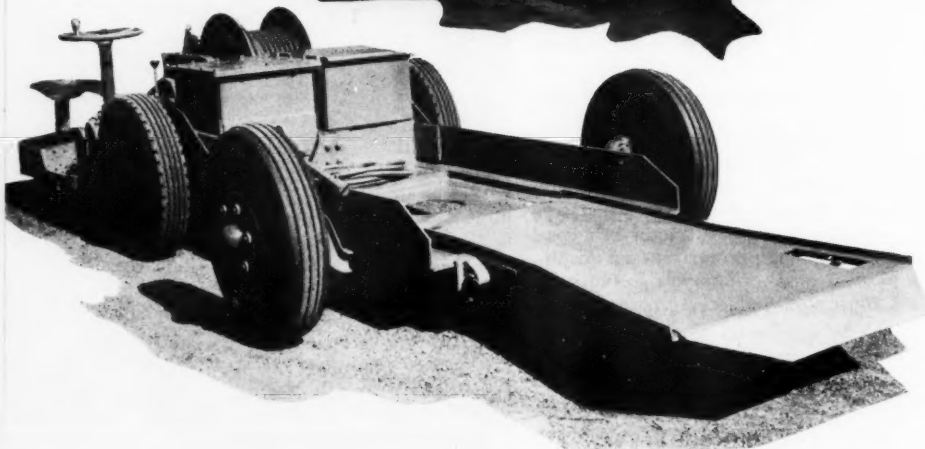
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The Coal Division Advisory Council Announces New Members

MANY coal engineers and operating officials, if you ask them, will say that they are not doing anything at their plants which would be of particular interest to others. This isn't false modesty, it is simply that these men do not realize the integral part that each one of them is playing in modernizing coal mining. It is just a part of their job to overcome difficulties and devise new methods, and when some particular problem has been solved in a brief time it becomes a routine part of their operation, so they forget it and go on to something else.

A complete compilation of all the answers that have been found to specific problems during the past 10 years or so adds up to the total sum of the progress which the industry has made, and all of us know what this is. But what we don't know and what would be of great value to know, are the trials and experiments which are behind each individual accomplishment, and the data and calculations which formed the basis for the final decisions.

The Council and the Committees

The Coal Division committees of the American Mining Congress do a considerable amount of what may be termed "original research"; but primarily they were organized on the premise that there is a wealth of valuable and available data already in existence, and that a large part of their work is to gather and compile such data as will have a fairly wide application to the industry. Coal companies as a rule are not averse to giving out information of this kind; the difficulty is to know where and when it exists. After a trial or investigation has been completed by a

company and the answer has been found, it often happens that the records of the experiments are not kept in permanent files; and a request for information, therefore, must be made before the records have become "cold." This means that, in addition to preparing their own reports, each committee can render great service by acting as field contacts for the other groups.

The Advisory Council of the Division, as its name implies, helps to formulate general policies and to recommend specific subjects for study and reports. However, they perform an equally important function in furnishing data from their own organiza-



T. G. GEROW

tions to the committees, and also by assisting in securing desired information from other companies. The Advisory Council is appointed by the directors of the American Mining Congress, who take pleasure in announcing the acceptance of appointment by five new members, whose photographs are shown on this page.

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With the COAL DIVISION

of the AMERICAN MINING CONGRESS

RATINGS OF VIBRATING SCREENS

● *A Report to the Committee on Surface Preparation*

By THOMAS FRASER*

Preparation Engineer
Bituminous Coal Division
United States Department of the Interior

IN coal-preparation practice, the inclined, high-speed vibrating screen is most widely used for approximate sizing. It has become especially popular for the preparation of pea and stoker grades and dedusted or modified screenings. Specification of the bottom size of these grades is usually not precise; and, because of the limited rate of screening at these small sizes, the operator tries to hit upon a combination of slope, speed, and opening size that will adapt the screen to operate at a high rate and to approximate a separation at the nominal size designation of the coal, within reasonable tolerance limits.

It is obviously difficult to prescribe a method of rating screens for capacity and sizing efficiency for such applications. There is usually a wide range of adjustments and changes, offering opportunity for experiment to obtain optimum performance out of a screen in any specific case. One must be careful, therefore, about drawing general conclusions as to the capabilities of a screen from performance tests of individual installations or about interpreting performance data of two operations making the same nominal size as a measure of relative merits of the two screens for general application.

Considerations in Selection of Screens

In the selection of a screen for a given duty, the principal problem is one of capacity, to determine the maximum rate at which the screen will handle coal at the size desired, and under the operating conditions that may prevail. The important conditions that will affect screen performance in this regard are (1) peak rate at which feed coal may be delivered to the screen, (2) proportion of

near-mesh particles in the feed, (3) proportion of oversize material in the feed, (4) the precision of separation required, and (5) frequency, duration and severity of moisture peaks in the run of feed coal.

The process of removing undersize material through a screen may properly be considered in two steps; first, the undersize material must pass down through the oversize bed to come in contact with the screen surface; and, second, the undersize particles must pass through the screen apertures. Both of these functions are obviously facilitated by suitably adjusted vibra-

tion—sufficient to open the oversize bed and to keep the screen cloth free from blinding; but without retarding passage of fines through the holes, which might happen with violent motion and a light scattering load on the screen.

Size Tolerance Determining Factor in Screen Settings

Rapid penetration of fines to the screen surface is hampered by excessive thickness of the oversize bed on the screen and by high surface moisture content. The rate of extraction

+ + +

REQUEST FOR CRITICISMS AND SUGGESTIONS

The author presents a clear and logical discussion of principles and factors affecting screen separations at small sizes; he presents data and suggests a method for determining the screen area necessary for required separations. He recommends further investigations and proposes tentatively:

1. That material between .75 and 1.5 screen opening diameters be considered near-mesh material.

2. That for thorough screening, depth of such near-mesh material on a screen should not exceed the size (width) of opening. He gives an example of calculations of width of screen required for a given rate of feed with a given percentage of near-mesh.

T. W. GUY, Chairman,
Surface Preparation Committee.

Each reader interested in this subject is urged to send his criticisms and suggestions, the source of which will be treated as confidential, if desired, and these suggestions will be forwarded to Mr. Guy.

+ + +

* Published by permission of the Director, Bituminous Coal Division.

of undersize through the screen apertures will likewise be retarded by high surface moisture in the feed and also by the presence of a layer of near-mesh particles on the screen. With a given rate of feed, the thickness of the bed of oversize and the bed of near-mesh particles on the screen will obviously vary with the rate of travel over the screen surface.

The maximum rate of effective screening is obtained when the feed travels over the screen at a relatively high speed and in a correspondingly thin layer. However, this method of obtaining high capacity performance is limited by the shortened time of contact of the feed with the screen and the flattened trajectory of undersize particles falling through the openings in the steeply inclined screen medium. Within reasonable limits, the latter effect may be compensated by using cloth with openings larger than the actual size separation desired, and by using oblong or long-slotted mesh which increase the percentage of open space and facilitate the passage of large quantities of material. This expedient, however, introduces another factor into the operation by increasing the loss of oversize particles in the through-product and generally decreasing the precision of sizing. Selection of the best combination of slope and aperture size depends, in the final analysis, upon the size tolerance allowable in the product and there is great opportunity for experimentation to hit upon the best setting.

Proportion of Near-Mesh Material in Feed Also Determines Rate of Screening

In any specific screen operation on a coal that is screenable as to moisture content and of a size consist and at a feed rate such that the oversize bed is not excessive, the determining factor in the rate of screening is the proportion of near-mesh material in the feed. The near-mesh material consists of the particles just slightly smaller than the apertures so that they pass through with difficulty, and those just slightly larger than the apertures so that they tend to wedge in the holes and pass over the screen surface slowly.

That part of the undersize product which is smaller than three-quarters of the size of the screen apertures will pass through immediately upon coming in contact with the cloth and that part of the oversize that is larger than one and a half times the size of the holes will pass over the screen without sticking in the holes or ma-

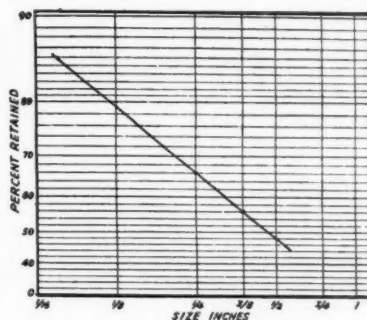


Figure 1

terially obstructing the downward passage of fines. The real job to be done that determines the area of screen surface required is the separation of near-mesh particles between over product and through product as completely as necessary to meet the preparation requirements. It seems fundamentally sound, therefore, to base the capacity rating of a screen upon the tonnage of near-mesh material to be handled.

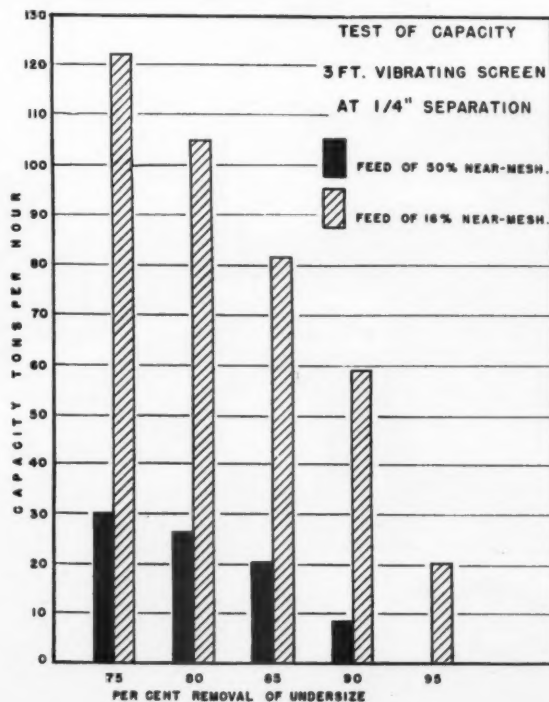
With a reasonably free screening feed, a satisfactory performance will generally be obtained by selecting a screen of such a size that at peak load the thickness of *near-mesh bed* on the

screen will not exceed one screen opening diameter, defining near-mesh material as that part of the feed ranging in size from $\frac{3}{4}$ opening diameters to $1\frac{1}{2}$ opening diameters. These limits are, of course, purely arbitrary and further experience might develop a more suitable specification of size limits to define near-mesh material; but this method of getting at capacities is inherently sound. Its value depends upon getting a proper relation between the size limits adopted to define the near-mesh range and the limiting tonnage allowable per unit of screen width.

Estimation of Screen Widths

For example, the screen width required to handle screenings, of the size consist represented by the screen analysis of Figure 1, at the rate of 100 tons per hour to make a separation at $\frac{1}{4}$ in. size may be estimated as follows: The near-mesh size zone is $\frac{3}{16}$ in. to $\frac{3}{8}$ in. and the proportion between these limits in the feed is 16 percent or 16 tons per hour, which is equal to 640 cu. ft. per hour, or 10.7 cu. ft. per minute. If the screen is set at such a slope and speed that the coal travels over it at the rate of 100 linear

Fig. 2. Relative capacities of vibrating screen on two types of feed material, showing the marked effect of a large proportion of near-mesh material on the tonnage that can be handled effectively



Note: The data for this graph were obtained by a series of tests of samples of unsized feed, and of an increment separated out of the same feed so as to supply material containing an unusually large proportion of near-mesh sizes. It represents, therefore, an extreme example which brings out the dominant relation of near-mesh material to screen performance.

With the COAL DIVISION

feet per minute, the cross-sectional area of the bed will be 10.7/100 or .107 sq. ft., and the width of screen required to spread this out to $\frac{1}{4}$ in. depth is .107 divided by $\frac{1}{48}$, or 5.136 ft. This indicates that two 3-ft. screens, or possibly one 5-ft. screen, will handle the load.

The final selection of screen cloth, slope, and speed is a matter of experiment to find the combination best adapted to handle a large tonnage and deliver the most uniform product. Performance will depend very much upon the variations in rate of feed and moisture content and the duration of high moisture runs. For any installation, the final answer as to size of screen is that required to deliver an acceptable over product under the most unfavorable conditions to be encountered.

Factors to be Investigated

Two important factors that offer opportunity for investigation are (1) the effect on screen performance of small proportions of moisture in the feed, including determination of the maximum surface moisture at which effective screening is practicable for various screen meshes and various sizes of feed for different types of coal; (2) for various sizes of screen apertures, the relation of screen slope

and rate of feed per unit of width to the actual size of separation.

Some figures on the first of these two factors are quoted from a paper * presented at the fall meeting of the American Institute of Mining and Metallurgical Engineers in 1930. These data summarize Mr. McLaughlin's experience in operation of screens at a dry-cleaning plant operating on the Pittsburgh coal. A vibrating screen clothed with $\frac{1}{4}$ in. ton-cap screen (apertures $\frac{1}{4}$ in. wide by $\frac{1}{2}$ in. long) will operate satisfactorily on coal containing up to 5 percent mechanical moisture content. This feed, however, will blind a cloth of $\frac{1}{8}$ -in. mesh and will give some trouble on $\frac{3}{16}$ in. Six percent moisture will not cause the $\frac{1}{4}$ -in. cloth to blind but will greatly reduce the effectiveness of the screens.

Table 1 gives approximately the effect of moisture content in the feed on the effectiveness of screens. These figures apply to the use of the standard type of oblong mesh cloth on vibrating screens. Sizes refer to net width of opening. Moisture percentages indicate mechanically held moisture above the natural vein moisture. The data are based upon experience with Pittsburgh coal of about 1.2

percent vein moisture. The efficiency figures express the percentage removal of available undersize material present in the unsized coal when the screen is fed at the rate that will give 95 percent effectiveness with dry coal—initial condition shown in first line, 2 percent moisture.

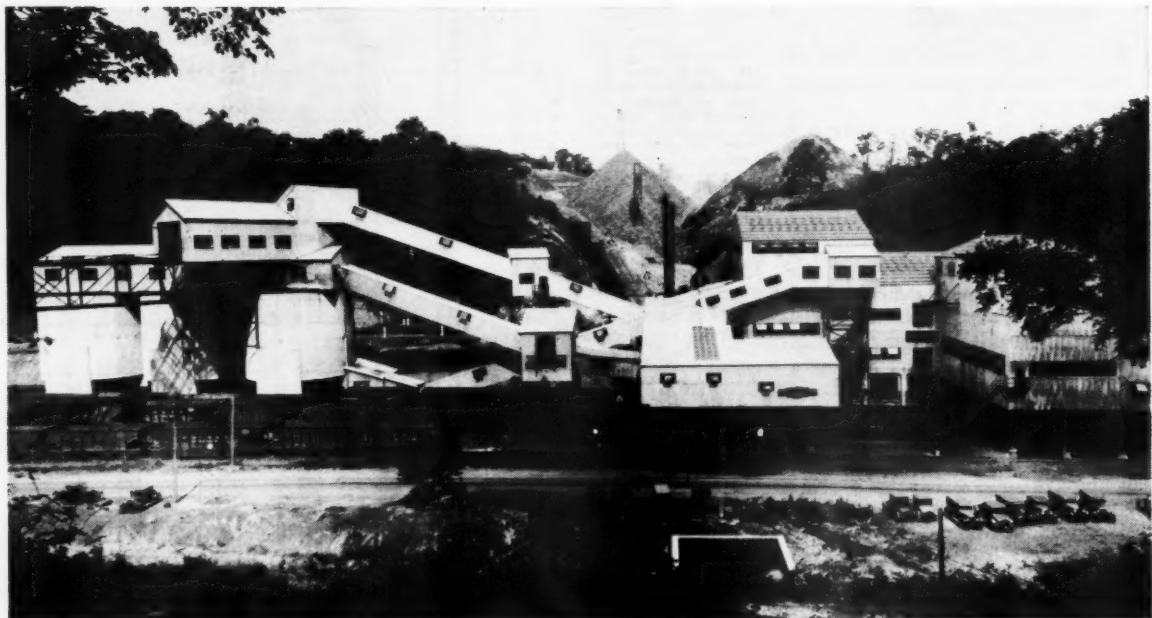
TABLE 1.—EFFECT OF MOISTURE ON EFFICIENCY OF SCREEN FED WITH MAXIMUM TONNAGE GIVING 95 PERCENT SCREENING OF DRY COAL

Moisture, percent *	Removal of undersize, percent—		
	$\frac{1}{4}$ -in. screen	$\frac{3}{16}$ -in. screen	$\frac{1}{8}$ -in. screen
2	95	95	95
3	60	75	85
4	20	50	70
5	Blind	20	40
6		Blind	20

* Mechanical moisture percentage—total moisture minus natural vein-moisture content. Size of feed $\frac{5}{16}$ in. to 0.

With moist coals, fairly complete screening can be obtained by increasing the screen area per ton of feed in inverse proportion to the above efficiency figures, but the size at which separation is actually made will be smaller than with dry coal on the same screen. As the moisture approaches the blinding point for any given size (in those parts of table showing efficiencies below 50), close sizing becomes impracticable with any amount of screen area.

* Fraser, Thomas, and McLaughlin, R. A., "Conditioning of Coal for Treatment by Pneumatic Cleaners," A. I. M. E., 1931, pp. 288-300.





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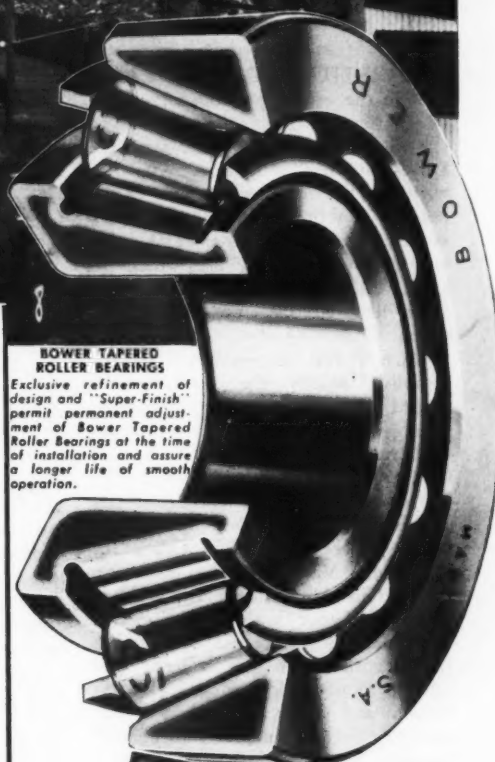
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WHEELS of Government

ADMINISTRATION pressure added to the growing seriousness of the international situation gave speed to the final stages of enactment of the Lease-Lend Bill in March. Approval was given not only to this critically important Act but both Houses quickly voted a seven billion dollar fund, as an initial appropriation with which to extend aid not only to Britain but to allies like Greece, Yugoslavia, and China.

With a full determination to accomplish results the country has turned to the problems of production, among which bulk heavily the difficulties created by strikes and industrial unrest. As a first move toward solving labor troubles the President has created an eleven-man mediation board under his personal Office for Emergency Management. Only cases certified to this board by the Department of Labor will be considered. The board is authorized to assist in the negotiation of agreements and afford means for voluntary arbitration, and to set up methods for resolving future controversies. Former Selective Service Administrator Clarence A. Dykstra is board chairman, and the public is further represented by William H. Davis, a patent attorney of New York, and Frank P. Graham, president of the University of North Carolina. Employee representatives are George Meany, General Secretary of the A. F. L.; George M. Harrison, president of the Brotherhood of Railway and Steamship Clerks; Philip Murray, president of the C. I. O.; and Thomas Kennedy, secretary-treasurer of the United Mine Workers of America. Representing employers are Walter C. Teagle, formerly president of the Standard Oil Company of New Jersey; Roger D. Lapham, president of the American-Hawaiian Steamship Company; Eugene Meyer, of the *Washington Post*; and Cyrus Ching, vice president, U. S. Rubber Corporation.

In his executive order creating the labor mediation board the President called upon employers and employees engaged in production or transportation of defense materials to make all

● *As Viewed by A. W. Dickinson of the American Mining Congress*

possible effort to avert stoppages of work. He asked that the Labor Department's Conciliation Service and the Office of Production Management be given advance notice by employers and employees of any contemplated changes in working relations, that there may be a reasonable time in which to make adjustments and settlements.

Increased Revenue Must Come

Present planning on the part of the Treasury calls for work to begin later this month on a revenue bill to obtain an additional \$2,000,000,000 from individuals and corporations. Increased business is expected to bring a part of this revenue; plans for the balance contemplate an upping of corporation rates from 24 percent to 27 percent together with a tightening of excess profits tax procedure, such as decreasing the invested capital basis from the present 8 percent to 6 percent. The normal tax on individuals would be increased from 4 percent to 6 percent and the individual surtax would start at \$3,000 instead of \$4,000 as at present, with higher surtax rates on the so-called middle brackets. Increased excise taxes will be expected to bring the total Federal revenue yield up to \$12,000,000,000. The recent talk about general sales' taxes or a manufacturer's excise tax appears to be subsiding.

St. Lawrence Seaway Agreement

A little later this year than the ground hog but quite as regular in its annual appearance, the St. Lawrence Seaway and Power project has again come forth in the form of an "agreement," which is really a treaty, recently signed by representatives of the Canadian and United States Governments. The President has asked approval of the House and Senate for

work in the International Rapids section along the New York State border, involving the expenditure of \$266,-170,000. The ultimate expenditure contemplated by this scheme is estimated at \$600,000,000 for United States taxpayers; and it is well to remember that our canal and waterway projects of the past have usually run to double and even triple the amount of the original estimates. Opponents state that if there were any shortage of power in the areas tributary to the International Rapids Section the situation could be corrected quickly by the erection of a number of steam plants at far less cost. Four to six years will be required to complete the project as contemplated in the treaty, and the thought of constructing vessels on the Great Lakes for use in the present emergency is hardly tenable since the seaway could not be completed in time to allow their use in this emergency. In addition, the seaway would be vulnerable to attack by bombing.

Wage-Hour Rulings

On March 23 General Philip B. Fleming, Administrator, Wage-Hour Division, made public his opinion putting the hours of the underground working shift in metal mining on a collar-to-collar basis. Based on a report made by Examiner Harold Stein, following the fact-finding conferences in Salt Lake City and Birmingham, the opinion controverts custom and practice of long standing in practically every mining region. A summary of the opinion reads:

"The workday in underground metal mining starts when the miner reports for duty as required at or near the collar of the mine, and ends when he reaches the collar at the end of the shift.

"The workday also includes the aggregate of the time spent on the surface, in obtaining and returning

lamps, carbide and tools, and in checking in and out.

"The workday does not include any fixed lunch period of one-half hour or more during which the miner is relieved of all duties, even though the lunch period is spent underground."

General Fleming has announced that the enforcement of the Wage and Hour Law in the underground metal mining industry will be based on the principles contained in the report but that, because the Division has not heretofore taken a definite stand on the problems involved, it would not seek to compel the payment of restitution retroactively from mine owners who have been operating on a face-to-face or other basis inconsistent with the principles of the report. It should be particularly noted that the release states "this enforcement policy of the Division cannot, however, interfere with the rights of employees or their representatives to sue under Section 16 (b) of the Fair Labor Standards Act."

April 1 was originally set as the enforcement date of the opinion, but has now been postponed to May 1 as the result of a further hearing conducted on March 27 by General Fleming. At this hearing representatives of the iron ore industry, The American Mining Congress and the Colorado Mining Association asked reconsideration of the opinion and pointed out that the collar-to-collar workday is not customary in the metal mining industry outside of Arizona and Utah, where it is required by state law.

Extend Guffey Act

After eight days of hearings the Committee on Ways and Means reported, and the House passed, a bill extending the life of the Guffey Act to April 26, 1943. Included in the bill was a specific provision that the Office of Consumers' Counsel be created as an independent Federal agency. The office is thus taken out of the General Solicitors Division in the Department of the Interior, where it had been placed following the creation of the Bituminous Coal Division under Secretary Ickes. The Committee on Ways and Means took further precautionary action by creating a subcommittee of seven members charged with the functions of receiving information and observing the administration of the Act, with a view to presenting recommendations to the full committee when deemed advisable. The bill now goes to the Senate where early passage is anticipated.

Strategic Minerals

Senator Sheppard, of Texas, has secured the passage of a bill in the Senate amending the Thomas Strategic Minerals Act to make available, for the purchase of additional strategic minerals, the money derived from the sale of stockpiles acquired by the Army and the Navy. As soon as this measure becomes law the money derived from the sale of any of these reserves will be immediately available for further purchases.

Priority controls under the OPM are continuing to tighten on aluminum, magnesium, tungsten, and nickel.

Although zinc was taken off the Army's list of critical materials more than a year ago, Government circles are now apparently awake to the critical need for this metal, particularly for the production of cartridge brass. Effective April 1, the OPM is creating a zinc pool by causing producers to set aside 5 percent of their total production to meet shortages which may occur in defense industries. In the meantime the Price Control Division which has been instrumental in holding the price of slab zinc at 7.25c at East St. Louis, has issued an order setting up maximum prices on zinc scrap and secondary zinc materials. On the other hand the Anti-Trust Division of the Department of Justice has begun an investigation of the zinc industry by issuing subpoenas for the production of the records of domestic producers.

Federal Mine Inspection

The Flannery Coal Mine Inspection Bill (H. R. 2082) has now passed both the House and Senate and is in conference. Early in March the House Rules Committee cleared the measure for House floor action under an agreement to eliminate by committee amendment on the House floor, the provision calling for inspections upon petition by a majority of the underground workers, or by their collective bargaining representative.

In the Senate Committee on Mines and Mining one undesirable amendment was made to the bill by striking out the following language: "That in the selection of persons for appointment as coal mine inspectors any inspector employed shall be an accredited mining engineer or the equivalent thereof with the basic qualification of five years practical experience in the mining of coal." At the request of Senator Guffey, of Pennsylvania, the following language was substituted: "That in the selection of persons for appointment as coal mine inspectors any inspector employed shall be a person with a basic qualification of five years practical experience in the mining of coal." No further attempt was made to amend the bill on the Senate floor. It is to be hoped that the House conferees will stand firmly for the House version on the qualifications of inspectors, and that the Senate conferees will agree to the language which will insure the selection of adequately trained men.

Cherry Blossom Time
In Washington



PERSONALS



Miles F. McDonald has been made vice president of the Butte Copper and Zinc Company, with office at Butte, Mont. He succeeds the late A. L. Bailey.

C. T. Van Winkle, of Salt Lake City, has been reappointed general manager of the Rico Argentine Mining Company; he is also a director.

At the annual meeting in Salt Lake City on March 24 the Utah Chapter of the American Mining Congress elected officers for the coming year as follows:



W. J. O'Connor

Governor, W. J. O'Connor, manager, Utah department, American Smelting and Refining Company; first vice governor, F. S. Mulock, vice president and general manager of Western operations, U. S. Smelting, Refining and Mining Company; second vice governor, Gloyd M. Wiles, vice president and general manager, Park City Consolidated Mines Company; third vice governor, J. O. Elton, manager, International Smelting and Refining Company; re-elected as secretary, A. G. Mackenzie.

C. K. Tieche on April 1 was appointed acting superintendent of the Imperial and Monarch operations of the Virginia Iron, Coal and Coke Company, Roanoke, Va. At the same time T. C. Hayes, Sr., was made assistant superintendent.

Harry E. Orr has been appointed sales engineer at the Chicago office of the Vanadium Corporation of America. He was formerly chief metallurgist of the Burnside Steel Foundry Company at Chicago.

M. M. O'Brien, of the Mining Engineering Department of Consolidated Mining and Smelting Company of Canada, Trail, B. C., has joined the Dominion Government at Ottawa as a dollar a year man. M. Fingland, of the Sullivan mine, Kimberly, has taken a similar position with the government.

Wm. W. Elmer has resumed his practice as consulting engineer at Portland, Ore. At present he is engaged in geological work and plant construction for Johnson Bros. at Prineville, Ore.

John B. Rich, president of the Mahanoy Valley Coal Company, recently announced that plans have been completed for building a preparation plant at Gilberton, Pa.

L. L. McDaniel has been placed in charge of construction work on the new Morenci Smelter of the Phelps Dodge Corporation, and will be superintendent of the smelter when construction is completed. He was formerly general foreman of the Phelps Dodge smelter of Douglas.

F. H. Hull, formerly acting superintendent of the Toms Creek mine of the Virginia Iron, Coal & Coke Company, Toms Creek, Va., has been appointed superintendent of the property.

Francis E. Finch is now associated with Centrifugal & Mechanical Industries, Inc. He was formerly president of Ruggles-Coles Engineering Company, and later was a vice president of Hardinge Company, Inc.

Howard N. Eavenson is president of Bituminous Coal Research, Inc. John C. Cosgrove was formerly president but is no longer in that capacity, as was recently stated in a news release.

Franklin G. Pardee, geologist and mining expert for the State of Michigan, located at Lansing, Mich., has been granted a leave of absence for 18 months and sailed in February for Rio de Janeiro, representing the U. S. Bureau of Mines. He will be attached to the American Embassy in Rio to study problems of the mineral industry of Brazil, in connection with the strategic minerals investigation.

Willard C. Adams is preparation manager for the Northern Illinois Coal Corporation, with headquarters in Chicago. He was formerly with the Koppers-Rheolaveur Company.

John Reuter has been made chief engineer on the Mesabi range for the North Range Mining Company, with headquarters at the Schley Mine, Gilbert, Minn.

Evan Evans has been made vice president and general manager of the Lehigh Navigation Coal Company in Lansford, Pa. He was formerly operating assistant to the general superintendent.

John G. Kleimola has been made superintendent of the Warren iron mine at Hibbing, Minn., operated by the M. A. Hanna Company.

Edward G. Dentzer, general manager of the Magma Copper Company, was recently elected a member of the board of directors of that company.

C. R. Bourland, formerly superintendent at Kopperston, W. Va., for the Koppers Coal Company, has been transferred to the Houston Division of the same company as division superintendent.

William G. McCulloch has been appointed coal preparation manager for the Roberts and Schaefer Company. He was formerly coal preparation manager of United Electric Coal Companies of Illinois.

Paul Helms has been appointed purchasing agent of the Roller Smith Company, Bethlehem, Pa., succeeding Harry A. Cassler, who retired the first of April.

L. G. Schraub has been made vice president and general sales manager of the Union Wire Rope Corporation, Kansas City, Mo.

Gomer P. Jones has been elected president of the British Columbia Chamber of Mines, Vancouver.

Robert H. Hendricks has been granted a leave of absence from the Empire-Star Mines Company, Ltd., to go to New York City, where he will be in charge of shell loading for the British Purchasing Commission. He is general manager of the Murchie and Zeibright Mines in Nevada County, and the Pennsylvania Mine in Yuba County, California.

C. E. Lilygren, manager of the metal department of the National Lead Company, Atlantic Branch, will retire June 1 after 45 years' service.

Charles B. Strachan, who has been general superintendent of the American Zinc Company of Tennessee at Mascot, Tenn., since 1918, has retired. He will remain with American Zinc, Lead and Smelting Company in an advisory capacity with headquarters either in Knoxville, Tenn., or St. Louis, Mo.

Harley A. Coy, who has held the position of mine superintendent since 1915, is being promoted to the position of general superintendent. Mr. Coy entered the employ of the company as engineer when the property was originally acquired in 1912.

William Black, who has been assistant mine superintendent, will succeed Mr. Coy as mine superintendent.

Carroll B. Huntress has been appointed vice president in charge of eastern sales with office in New York for the Republic Coal & Coke Company.

R. E. Christie, assistant to the president of the Crucible Steel Company, New York, has been made a vice president and director.

Wade W. Walker has been elected president of the Ashland Coal & Coke Company, and the Majestic Collieries Company, succeeding the late W. A. Richards. He will continue as vice president of the Pemberton Coal Company.

J. E. Westervelt has been made president of the Sovereign Pocahontas Coal Company. He was formerly vice president in charge of sales, with headquarters at Bluefield.

C. P. Brinton is in the employment of the Semet-Solvay Company, located at Welch, W. Va. He was formerly with the Barnes & Tucker Company, Barnesboro, Pa.

— Obituaries —

Benjamin F. Hoffacker, Sr., coal geologist and engineer of Pittsburgh, Pa., died March 24.

Mr. Hoffacker was born in Baltimore, Md., and had been in business in Pittsburgh 35 years. He was a member of the Duquesne Club, the Oakmont Country Club and the Pittsburgh Athletic Assn.

Surviving are his wife, Mrs. Carrie Todd Hoffacker; a son, Benjamin F. Hoffacker, Jr.; a brother and five sisters.

B. B. Nieding, prominent in Alaska mining circles and former superintendent of several large Alaska mines, died in March, in Duluth, Minn., following a heart attack.

He first went to Alaska in 1905 as superintendent of the Niblock mines. From 1918 to 1928 he was general manager of the Kennecott and Latouche mines. At the time of his death he was consulting engineer for the Congdon Office Corporation at Duluth.

Jerome James Day, prominent in Coeur d'Alene mine affairs, died on March 9, in Phoenix, Ariz., where he had been receiving medical attention. He was 64 years old at the time of his death. He was identified with a number of companies in the Coeur d'Alene district.

Thomas Harry Jenks, well known mining engineer and operating official died on March 3 in Denver, at the age of 72. He was president of the Coeur d'Alene Mining Company of Colorado, and the Gold Range Mining Company of New Mexico.

William Chester Madge, 70, resident manager of the Sierra Nevada, Ltd. mine at Virginia City, died on February 12 at Reno, Nev.

Metal Mining Convention Gets Under Way



JAMES W. WADE
General Chairman, Program Committee



P. R. BRADLEY
General Chairman, Arrangements

At the request of Howard I. Young, President of the American Mining Congress, and William C. Browning, Chairman of the Western Division, James W. Wade and P. R. Bradley have agreed to serve as General Chairman of the Program Committee and General Chairman of the Arrangements Committee, respectively, for the 8th Annual Metal Mining Convention and Exposition, to be held at the Fairmont Hotel, San Francisco, September 29 to October 2.

Mr. Wade is vice president and general manager of the Tintic Standard Mining Company, and president and general manager of the Eureka Standard Consolidated Mining Company and Eureka Lily Consolidated Mining Company, Salt Lake City.

Mr. Bradley is president of Alaska Juneau Gold Mining Company and Treadwell Yukon Corporation, and vice president of Atolia Mining Co., Pacific Mining Company and Bunker Hill & Sullivan Mining & Concentrating Company.

Widely known throughout the metal mining industry, the acceptance by these two men of the most important committee chairmanships assures a most successful meeting in the Golden Gate City.

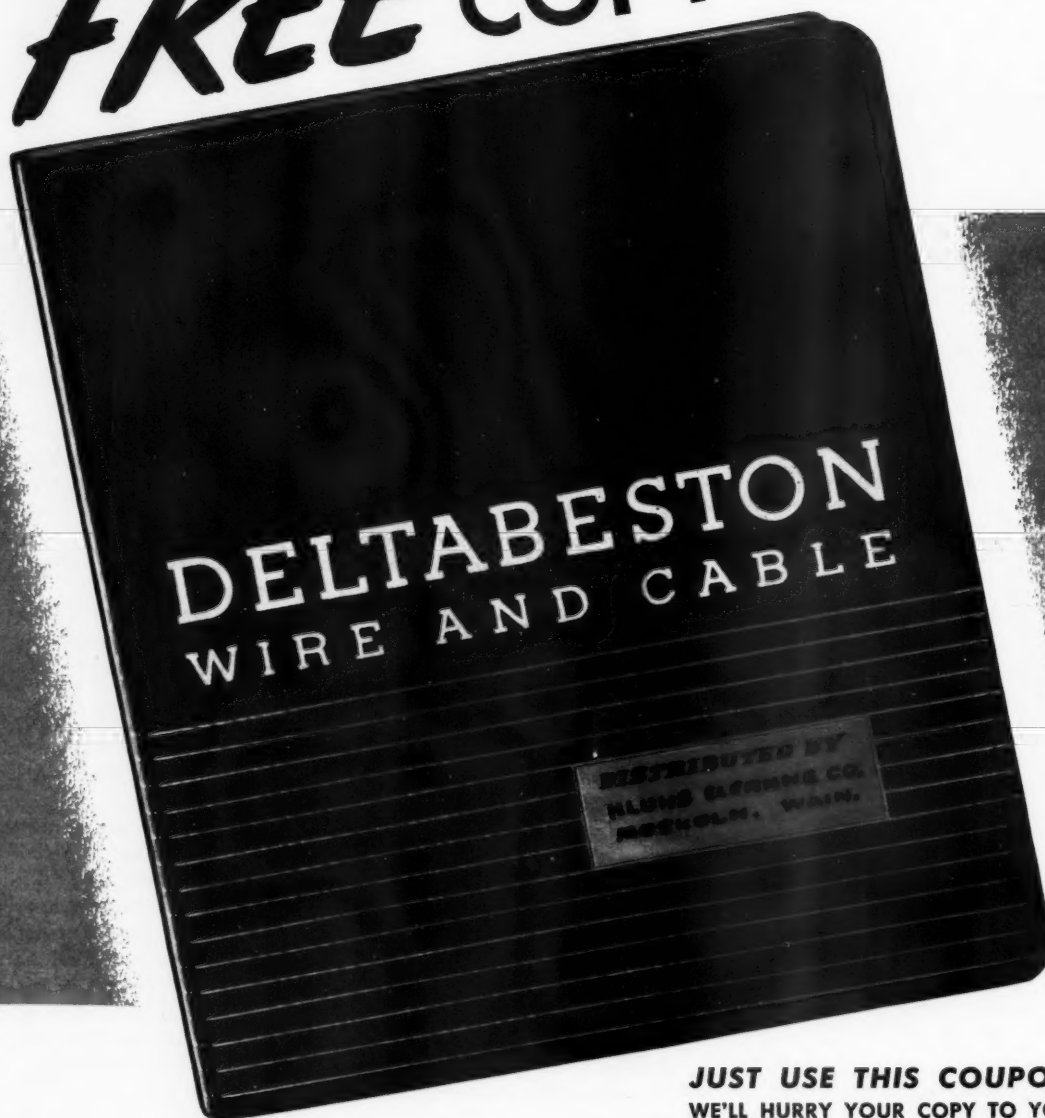
State chairmen and members of the Program Committee, together with committees on entertainment, reception, ladies' entertainment, exhibits, finance, publicity, attendance and trips, will be appointed shortly.

The Metal Mining Convention and Exposition of 1941 is of greater importance than ever before, coming as it does in the midst of the mining industry's strenuous effort to supply the basic sinews of national defense. The meeting will afford an opportunity for metal mining men throughout the country to discuss the many new problems which have arisen in this critical period, to coordinate their efforts for efficient maximum production, and to work out further plans for full cooperation in the defense program. Of special significance will be the manufacturers' exhibits of the latest developments in machinery and equipment to aid in present-day production problems.

C. R. Messinger, president of the Chain Belt Company and identified with many other business interests in Milwaukee and Chicago, died suddenly of a heart attack on February 4 at his home in Milwaukee.

Joseph Williams, age 42, superintendent of the Powhatan Mining Company, Powhatan Point, Ohio, and James Stewart, assistant superintendent of the same company, died on February 9, when their automobile was wrecked near Moundsville, W. Va.

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NEWS and VIEWS

Coal Company Official Endorses Guffey Law Extension

At a hearing in Washington in March, held by the House Ways and Means Committee to determine views on possible extension of the Guffey Act, George W. Reed, of Chicago, vice president of the Peabody Coal Company, and an official of Dr. Garfield's Federal Fuel Administration during the first World War urged that the Guffey Act be extended after the present expiration date.

Mr. Reed told of the months that were required to work out emergency measures to cope with transportation difficulties and other problems in 1917, when fuelless days were established and prices and distribution were restricted. "It is entirely possible," he said, "that the conditions which caused the shortage of coal during the last war will again develop in the near future. The extension of the act for two years will insure complete and accurate records on current production and movement of bituminous coal, which with a trained personnel and equipment of the Bituminous Coal Division, could be used immediately to restrict the movements of coal in the event such a necessity arises and thereby avoid suffering among the people in interference with the national defense program.

"It will also protect the consuming public against abnormal high prices and prevent inflation of the productive capacity of the industry such as occurred during the last war and from which the industry has not yet recovered."

New Shafts in Tri-State

News was recently received of three new shafts being sunk in the Tri-State District.

The Madison Mining Company is sinking on the Thomas land, northeast of Hockerville in Kansas, a short distance northeast of the company's mill. The shaft will be put down to a depth of 105 feet to develop an ore body already outlined by drill holes.

The Eagle-Picher Mining & Smelting Company will sink a shaft on the Gordon lease, west of Monarch on the Kansas-Oklahoma state line. A steel derrick and equipment is being moved from the Grace B. lease. The shaft will be sunk to a depth of 250 ft., to develop an ore body developed by churn drilling.

Kansas Explorations, Inc. will sink a shaft on the Snapp land, two and one-half miles northwest of Oranogo, Mo. The new shaft site is west of the No. 1 shaft, which is now below the 100 ft. level. Both will be sunk to the 250 ft. level or lower.



Technical Advisory Board of Bituminous Coal Research Holds Initial Meeting

Meeting at Battelle Memorial Institute, Columbus, Ohio, on March 3, the Technical Advisory Board of Bituminous Coal Research, heard reports on the progress of the program that was started at Battelle for the coal industry on November 15, 1940. The advisory group is composed of engineers who were recommended by member companies and appointed by Howard N. Eavenson, president of Bituminous Coal Research.

Julian E. Tobey, vice president in charge of engineering for Appalachian Coals, Inc., was appointed chairman of the Technical Advisory Board and of a smaller Technical Executive Committee that will guide the program between meetings of the larger board.

The projects now under investigation were selected from those recommended by meetings of fuel engineers held in Pittsburgh in March, 1939, and in Chicago in April, 1940. These projects include the development of smokeless hand-fired stoves and furnaces, completely automatic home heating units, gas producers, new firing devices for industrial process heating, and a coal-dust engine. Other projects are a study of dustproofing for porous coals, an information service, and the coordination of coal research.

With many of the larger cities renewing their campaigns of smoke prevention, one of the urgent needs of

the industry, Mr. Tobey pointed out, is a stove that will burn both low- and high-volatile coals smokelessly and require a minimum of attention. Work is in progress on this subject, stated Ralph A. Sherman, supervisor of the Fuels Division, and the facilities of the Fuels Laboratory have been doubled for rapid measurement of the performance of stoves and furnaces that show promise in solving the smoke problem. Stove manufacturers are cooperating with this work.

The engineers agreed that efforts of the research program should be directed toward the development of equipment that will burn a wide variety of coals and that will handle coal and ash automatically. Howard Limbacher, of the Battelle staff, reported on the highlights of one stoker with automatic ash removal that had been under test in the laboratory for some weeks. A variety of coals has been used in these tests.

The Technical Advisory Board recommended preliminary work on the use of coal in radiant tubes for industrial furnaces, investigations of new materials for dustproofing coals, and the coal-dust engine. Because of its value to the industry, cooperation of the research agency with the coal and stoker conferences that are held in a number of states was approved by the group.

After the meeting the engineers visited the Battelle Fuels Laboratory, where tests on stoves and stokers were discussed with the fuels engineers engaged in the work.

Members of the Technical Execu-

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tive Committee, who are also members of the Technical Advisory Committee, in addition to Mr. J. E. Tobey, chairman, include the following:

Thomas C. Cheasley, Sinclair Coal Company, Kansas City, Mo.; Henry F. Hebley, Pittsburgh Coal Company, Pittsburgh, Pa.; Fred K. Prosser, Norfolk & Western Railway, Roanoke, Va.; C. A. Reed, National Coal Association, Washington, D. C.; George G. Ritchie, Chesapeake & Ohio Railway, Richmond, Va.; R. L. Sutherland, Truax-Traer Coal Company, Chicago, Ill.

In addition to the above, the following are members of the Technical Advisory Board:

Paul Barkman, Cleveland Cliffs Iron Company, Cleveland, Ohio; C. B. Baton, Baton Coal Company, Pittsburgh, Pa.; G. A. Brady, Middle States Fuels, Inc., Chicago, Ill.; J. D. Doherty, Koppers Coal Company, Pittsburgh, Pa.; Homer M. Faust, New York Coal Sales Company, Columbus, Ohio; L. W. Householder, Rochester & Pittsburgh Coal Co., Indiana, Pa.; E. J. Kerr, Island Creek Coal Company, Huntington, W. Va.; E. S. Pugh, Raleigh Smokeless Coal Company, Beckley, W. Va.; R. L. Rowan, General Coal Company, Philadelphia, Pa.; John Scott, New River Company, Mt. Hope, W. Va.; L. A. Shipman, Southern Coal & Coke Company, Knoxville, Tenn.; R. F. Stilwell, Red Jacket Coal Sales Company, Columbus, Ohio; Max A. Tuttle, Knox Consolidated Coal Corp., Indianapolis, Ind.; and a representative of the Big Sandy-Elkhorn Association to be appointed.

Tungsten Plant To Be Enlarged

The Nevada Massachusetts Co. has been granted permission by the National Defense Commission to enlarge its tungsten plant at Mill City, Nev., at a cost of \$400,000. Operating the Humboldt, Stank, and other properties, the corporation is milling about 250 tons of scheelite daily and is the leading American producer of tungsten.

Enlargement of the plant will enable the company to mill about 400 tons of ore per day and increase the percentage of extraction. A tailings retreatment plant with a daily capacity of 1,000 tons was recently completed.

Golden Zone Mine Ships Concentrates

The first shipment of concentrates from the new Golden Zone Mine on the west fork of the Chulitna River, Alaska, went out over the Alaska Railroad recently. The five-ton ore shipment is the initial production of the lode property developed 11 miles from Colorado station by W. E. Dunkle.

The mine is financed largely by Alaska capital, many of the miners themselves having shares. Machinery for the most part came from the old Kennecott operations. The Golden Zone's 150-ton mill will run the year round.

Priorities System Established

In February E. R. Stettinius, Jr., director of priorities for the Office of Production Management, issued a bulletin announcing a working arrangement for the operation of the priorities system. The plan was formulated to facilitate the handling of problems arising in connection with the application and issuance of preference ratings. One of the five sections of the Priorities Division is devoted to minerals and metals, and the arrangement will undoubtedly affect further as time goes on, minerals and metals in which shortages develop, as has already been the case with aluminum, zinc, and other materials.

The arrangement is a broad one, covering the entire sphere of the priorities system, and clarifies the relationship between the operations of the Army and Navy Munitions Board, concerned primarily with military needs, and the wider field of general industrial and civilian needs which are administered by the Priorities Division.

Under the arrangement, the Priorities Division will divide administration of the system along practical lines, supplementing its own organization by the available facilities of the two armed services.

The Army and Navy Munitions Board, as in the past, will determine priority ratings covering all items on the "critical list." This list, composed primarily of military items and certain parts of such items, may be expanded as the need arises through mutual agreement between the Priorities Division and the Army and Navy Munitions Board. The Munitions Board will also handle the extension of priority ratings down to the first subcontractor, for items on the critical list.

Authority over priority ratings for all raw materials, for extensions of ratings below the first subcontractor, over items not on the critical list, and over the general field of civilian and commercial needs, will lie with the Priorities Division. The Division will also have authority over questions that may arise in the application of the formula to specific cases.

Priority certificates, bearing reference to statutory authority, are mandatory in the sense that they may be enforced, if necessary, though it is hoped that contractors affected will cooperate. The President has reposed his statutory powers over priorities in the Office of Production Management and all certificates will go out over the signature of the director of the Priorities Division.

The Priorities Division will continue its efforts to avoid imposition of mandatory enforcement steps as much as possible. This will be done by working in close cooperation with the Division of Production, with a view toward adjusting production schedules and expanding production to meet arising needs, and with the Division of Purchases, with a view toward finding alternative sources or methods of supply whenever shortages appear.

The arrangement was worked out by representatives of the Priorities

Division and of the Army and the Navy. It is, of course, subject to revision from time to time.

Primarily the priorities system is intended to implement the purchasing and production of defense material required by the War and Navy Departments. The priorities certificate is the principal administrative mechanism, and constitutes a notice to the contractor affected that a certain material is to be given preferential treatment, if necessary, in order to meet delivery dates.

A prime contractor may make application for extension of his priority rating to a subcontractor if the latter is producing items on which preferential treatment is needed. As to items on the critical list, the prime contractor may obtain extensions of ratings through the Munitions Board and the contracting officers. For items not on the list, he will seek relief from the Priorities Division.

Administration of priorities by the Priorities Division is handled in five sections: (1) Minerals and Metals; (2) Chemicals; (3) Commercial Aircraft; (4) Tools and Equipment; (5) General Products. These sections are advised by experts familiar with problems in their fields and by committees set up to balance possibly conflicting interests.

Anthracite Institute Opposed to Measures Inimical to the Industry

Speaking on The Work of the Anthracite Institute at a meeting of the New York State Retail Solid Fuel Merchants Association in New York recently, Louis C. Madeira III, executive director of the institute, stressed the importance of opposition to one Federal activity and one New York State activity, and called upon the association to adopt resolutions opposing these activities. The Federal activity involves the St. Lawrence Seaway Project, which has been more recently referred to in the public press in connection with an alleged need for an additional power supply to assist in the national defense program. The state activity involves companion bills introduced in the Assembly and Senate at Albany seeking to adopt a revised form of the New York State Standard Fire Insurance Policy which, as stated by the director, "is opposed by the anthracite industry in the interest of its consumers, not in a spirit intended to block a recognized need for a modernizing and clarifying revision of the fire insurance policy, but, in general, on the grounds that the new policy should carry separate specific rate charges for coverage of losses due to fire, for explosion, and for smoke and smudge damage. The bills as now drawn would force an anthracite consumer to pay for coverage which he does not need."

Mr. Madeira stated also, "This industry is confronting, and will continue to confront on an enlarged scale, movements to utilize existing pipelines, or construct new ones, for the transportation of either oil or gas

from remote fields into our primary markets." Referring to an effort to introduce natural gas into Lancaster County in Pennsylvania, he stated that this effort was successfully opposed last year by the Anthracite Institute before the Pennsylvania Public Utility Commission. A more serious threat, however, is still before the industry and has a bearing on the future of the entire solid fuel producing, transportation, and distribution industries. This is the proposal of a pipeline company in Texas to construct a 1,500-mile pipeline to transport natural gas into a market area defined by the applicant who has petitioned the Federal Power Commission for permission to construct the line as "the Philadelphia, New Jersey, Metropolitan New York City market." In opposition to this application, the Anthracite Institute has filed petitions with the Federal Power Commission and presented an objection to the National Defense Commission, the latter objection being registered jointly with the bituminous coal industry and allied interests.

Lake Bottom to Become Iron Mine

A mining operation involving unusual engineering features may develop from investigations now under way at Steep Rock Lake in northwestern Ontario, two and one-half miles north of the village of Atitkogan, which is on the Canadian National Railway, 135 miles west of Port Arthur. Geological and geophysical investigations, and an extensive drilling campaign have proven that a large body of high grade hematite iron ore underlies the lake. Before mining is started, however, it will be necessary to drain the lake and divert the inflow to other channels.

As long as 50 years ago iron ore float was found on the shores of Steep Rock Lake and suggested the possibility that commercial deposits existed nearby. In later years various investigations were made, and some test-pitting and drilling was done. In 1930 a dip-needle survey of the lake was made, and in 1937 a company was formed to conduct the drilling campaign.

A recent interim report issued by the company controlling the site says that drilling was carried on for two winter seasons from the lake ice, and that the drilling campaign has resulted in the discovery of three iron orebodies. A total of almost 18 miles of diamond drill holes have been put down. The ore is hematite of an indicated grade of 60 percent plus. In the two orebodies so far outlined it is calculated that there is a possible 162,000,000 tons of ore to a depth of 1,000 ft. In the drill holes good ore intersections have been made at depths ranging to 1,400 ft. vertically below the lake surface, indicating that the orebodies may go to even greater depths.

Before these deposits can be exploited, however, it will be necessary to divert the Seine River entirely around the basin in which the ore-

bodies occur. The lake is really an expansion of the Seine River, occupying a deep basin resulting from erosion in the soft rock formations in which the orebodies occur. It will also be necessary to pump out Steep Rock Lake as a preliminary to starting operations.

The river diversion will necessitate the moving or elimination of an existing hydro-electric plant. It is calculated that these preliminary operations will permit mining for a number of years by open-pit methods from the tops of at least two of the three known orebodies.

Second Dredge To Be Installed on Livengood Placers

A second dredge is to be placed on the placer property at Livengood, 90 miles northwest of Fairbanks, Alaska, according to Estey A. Julian, vice president and consulting engineer of Livengood Placers, Inc. The first dredge was started in September, 1940, and has a capacity of 10,000 yds. per day. The company has reported approximately 32,000,000 yds. of gravel with an average value of more than 50 cents a yard.

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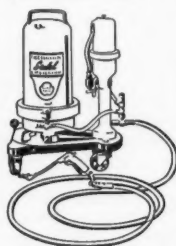
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Zinc Institute Sets Date For Annual Meeting

The Twenty-Third Annual Meeting of the American Zinc Institute will be held April 28 and 29, at The Hotel Chase in St. Louis, Mo.

Reports from officers and standing committees of the institute, and other institute business affairs, are scheduled to occupy the time of the initial session, according to Ernest V. Gent, secretary of the institute, who also announces that arrangements for the remainder of the program are well under way. Emphasis will be placed on zinc and the part it plays in the national defense program, and special speakers are being secured to discuss several phases of this general subject as it relates to both the domestic and foreign situations. Qualified representatives from the various domestic zinc-producing regions are listed to give reports on the condition of the industry in those regions.

The annual dinner and entertainment will be given at The Hotel Chase on Monday evening, April 28.

Modified Portal-to-Portal Wage-Hour Opinion

Following informal fact-finding conferences on metal mining practices held in Salt Lake City and Birmingham before Harold Stein, assistant director of the Hearings Branch, General Philip B. Fleming, administrator of the Wage and Hour Division, U. S. Department of Labor, announced in the latter part of March a modified portal to portal wage-hour opinion.

A summary of the opinion, contained in a report by Mr. Stein, follows:

"The workday in underground metal mining starts when the miner reports for duty as required at or near the collar of the mine, and ends when he reaches the collar at the end of the shift.

"The workday also includes the aggregate of the time spent on the surface in obtaining and returning lamps, carbide, and tools, and in checking in and out.

"The workday does not include any fixed lunch period of one-half hour or more during which the miner is relieved of all duties, even though the lunch period is spent underground."

The Wage and Hour Division says that practices of the metal mining industry are so unusual that Administrator Fleming has frequently been asked to express his opinion as to the application of the general principles of determining "hours worked" to certain factual situations typical of underground metal mining. In order to base his answers to these requests on the fullest possible knowledge, an investigation was conducted including field surveys and questionnaires, reports by the division's regional directors, and public conferences before Mr. Stein at Salt Lake City, December 11-12, 1940, and Birmingham, January 14-15, 1941. Many supplemental statements and briefs were also filed by employers, their associations, and by unions, says the Wage-Hour Division.

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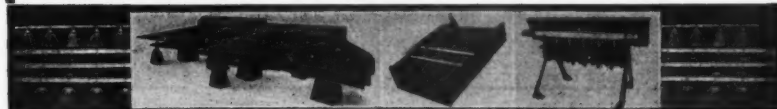
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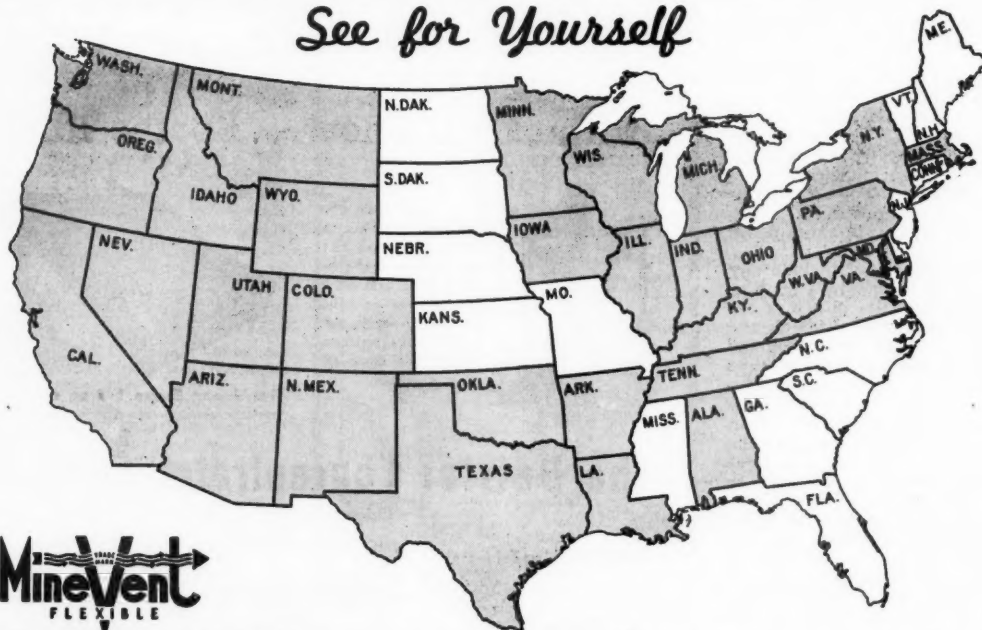
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Electron Microscopes Aid Mining Research

America's first commercially built electron microscope, which enables scientists to picture minute objects at 100,000 times natural size, is now being operated in the laboratories of the American Cyanamid Company, according to an announcement made in January by the company. Although several experimental microscopes of the kind have been built and tried, the first American commercial instrument is being used by American Cyanamid's scientists to develop new chemicals for industry and medicine. The instrument was developed and built by the RCA Research Laboratories in Camden, N. J.

Results already obtained by research workers of the company in the study of pigments used in the paper industry (precipitated chalk and magnesium oxide) show that infinitely fine particles of these materials possess the same crystalline structure in small as in large pieces. This disproves the theory widely held heretofore that such pigments lose their crystalline character when precipitated as infinitesimally fine particles.

Photographs made directly in the electron microscope show the object magnified 20 to 30 thousand times. However, details are so clearly pictured in these photographs that they can be readily enlarged to give a total useful magnification of 100,000 times natural size. An average human hair subjected to such huge magnification would appear to have a diameter as great as California's giant trees, and an object an inch long so magnified would appear to be more than one and one-half miles in length! The limit of magnification of the best optical microscopes is about 1,000 times natural size.

Photographs made in preliminary tests of the instrument show what are presumed to be individual giant molecules, the shapes and sizes of colloidal particles, and intimate details of certain types of bacteria, which the weaker power of optical microscopes could not reveal. Individual giant molecules of poly-vinyl chloride resin have been pictured with the aid of the electron microscope. Particles of colloidal carbon appear generally spherical in shape and on a diameter of about four 10-millionths of an inch.

Applications of the new instrument in the American Cyanamid laboratories are expected to uncover new and important facts about the action of catalysts, which mysteriously promote chemical reactions; about the action of chemicals on the bacteria of disease, since it may be possible to see how the drug actually killed the germ; and about the nature of synthetic resins and the processes by which they are formed. Other fields in which the laboratory is actively engaged, and to which the new instrument will be applied, include the flotation of ores and the recovery of metals by cyanidation; the manufacture of special chemicals used in the leather and paper industries; the treatment of textiles; rubber chemicals and their action in prolonging the useful life of rubber goods; synthetic resins, and

plastics and enamels into which they enter; insecticides and fungicides, important to agriculture in the control of insects and diseases of plants; fertilizers and plant hormone substances; and a wide variety of chemical products, many of which are made from the company's basic raw material, calcium cyanamide.

The electron microscope is based on the fact that fast-moving electrons possess a wave length far shorter than that of visible light. In the best optical instruments, the wave length of visible light places a lower limit on the size of the smallest detail in an object that can be seen, however great the magnification may be. Practically, this limit is reached when the object is magnified one to two thousand times. If ultraviolet light of shorter wave length is used in a microscope provided with quartz lenses, still smaller objects can be photographed and studied. The limit of magnification of an instrument of this type is about twice that of a microscope using visible light. In the electron microscope, the radiation involved is an actual stream of infinitesimally minute electrically charged entities, called electrons, whose associated wave length is of the order of a hundred thousand times smaller than the wave length of even ultraviolet light. As a result of this minute wave length the limit of the useful magnification of the present electron microscope—and this may be substantially increased by future development—is approximately one of two hundred thousand times actual size. Thus, objects whose dimensions are one-one hundredth to one fiftieth those of the smallest object to be seen with visible light can be pictured with electrons in equal detail.

The electron microscope resembles in principle a radio tube in which a hot filament serves as a source of a stream of electrons. Unlike a radio tube, however, the stream of electrons in the microscope is focussed and directed through a vacuum tube about 4 feet long by magnetic "lenses." These "lenses" are actual electromagnets which cause the stream of electrons to focus or change direction in much the same way the glass or quartz lenses focus light. The stream of electrons thus produces extraordinary magnification of the image of an object through which it has passed. The electron stream originating from the electrically heated tungsten wire filament is given high velocity by an electrical field of 50 to 60 thousand volts produced in that part of the instrument. The swift stream of electrons is then passed through a magnetic field to focus it on the object being examined. As the electron stream passes through the thin section of the specimen, variations in its thickness or density scatter or absorb parts of the beam. When the beam is finally focussed on the viewing screen or photographic plate an image of the object is formed. The entire instrument is continuously pumped to a high vacuum to prevent scattering of the electrons by collisions with molecules of air or other gas that might otherwise be in their way.

The image of the object examined is obtained by placing a fluorescent screen, similar to that used with X-rays and in television receivers, in the path of the electrons. The screen glows in proportion to the density of the electron stream striking it and thus reveals the magnified image. A photographic plate can be substituted for the fluorescent screen to take a picture of the object. Ordinarily the magnification of the contact print from the photographic plate is about 10 to 30 thousand times natural size. However, the details of the object are so clearly delineated that the photograph can easily be enlarged many times to give a final magnification of one to two hundred thousand times.

The smallest distance that has so far been clearly revealed by the electron microscope is about 30 Angstrom units (about one ten millionth of an inch). This is shorter than the dimensions of the molecules of synthetic resins as deduced from indirect measurements. Thus the size of large molecules may be actually measurable by means of the new instrument.

The electron microscope consists of a straight metal tube about 4 feet long, provided with electron source, three magnetic "lenses," a special air lock for introducing the specimen and a second air lock for placing the photographic plate in position. Essential to its operation is a source of electric current of exactly controlled voltage. The voltage regulating equipment consists of 52 vacuum tubes (enough for five modern trans-Atlantic radio receivers) with accompanying apparatus for converting ordinary commercial electric current to one of 50,000 volts constant within a single volt.

Can Utilize Coal Dumps in Water Purification

Coal from refuse dumps of mines can be utilized to make drinking water clear, tasteless and odorless, it has been shown through experiments conducted by the Bureau of Mines at its Southern Experiment Station, Tuscaloosa, Ala.

According to a report just issued by the Bureau, investigations carried out in cooperation with the University of Alabama have demonstrated that the refuse from coal mine washeries generally contains some good coal mixed with the waste, and that this coal can be readily made into "activated carbon," a substance which is used now for water purification by the more progressive water-supply plants.

The experiments, the Bureau's report states, were undertaken as part of a general project to find and develop all sorts of uses for coal refuse. To make activated carbon or char for water-purification purposes, only the higher-carbon fractions of the refuse, that is only the good coal which constitutes a small percentage of the waste, have been utilized. For this reason it may prove more economical in most instances to use good coal directly from the mines rather than that from refuse dumps.

Scholarship Established in Memory Of Late Smelting Firm Manager

In memory of the late E. A. Hamilton, general manager of mines of the United States Smelting, Refining and Mining Company, who died in February, the company has announced the founding of the Edward A. Hamilton Scholarship for study in engineering at the University of Utah.

According to F. S. Mulock, vice president and general manager of western operations, the scholarship carries an annual stipend of \$400 for a four-year university course.

Eligible for the scholarship are sons of salaried employees of the company, making not more than \$250 a month and in the employ of the company for at least five consecutive years. Also eligible are sons of former salaried employees whose services with the company were continuous for 10 years or more at one or more of its intermountain operations, whose services were terminated by death or retirement after January 1, 1931, and whose salary during the last five years of employment did not exceed \$250 a month.

Applicants for the 1941 fall term scholarship at the University of Utah must have been graduated from an accredited high school since January 1.

At the same time, Mr. Mulock announced the 1941 Downie Davidson Muir, Jr., and Walter Hazen Eardley Scholarships, to be awarded this year for the third time to sons of daily-wage employees of the company.

The Eardley Scholarship for study in nonferrous metallurgy at the University of Utah is offered by the company in memory of the late Walter Hazen Eardley, former manager of the Midvale plant.

The Muir Scholarship for study in mining and geology at the university is offered in memory of the late Downie Davidson Muir, Jr., former vice president in charge of western operations.

The scholarship committee of the University of Utah will conduct all investigations and tests. Winners of the scholarships will be announced in June.

Carbide Plant to be Built in Northwest Can Also Treat Chrome and Manganese Ore

Announcement was made last month that property in the vicinity of Portland, Ore., has been acquired for the site of a new manufacturing plant of Electro Metallurgical Company, a unit of Union Carbide and Carbon Corporation. Construction will start in the near future.

This plant will be designed to manufacture calcium carbide and ferrosilicon. In addition, as demand develops and as local supplies of chrome and manganese ores become available in commercial quantities, manganese and chrome-bearing alloys can also be produced.

Shaft Sinking Establishes World's Record

The West Rand Consolidated Mines in South Africa, in the month of April last year, sank a new shaft a distance of 441 ft. The vertical shaft had six compartments, with an excavated area measuring 37½ ft. by 13½ ft. Four separate crews were employed on 8-hr. shifts for the 30 days of the month. Electric blasting was used. The advance was 14.7 ft. per day which is said to be a world's record for that size of shaft.

University of Alaska Has Mining Extension Course

The University of Alaska is holding a mining extension course this spring at Valdez, similar to the course offered there two years ago.

The work will be in charge of Robert Lyman, who will instruct the class in geology, mineralogy and mining, the principal subjects of the course. There is no tuition charge, only cost being the purchases of books, blowpipes and other materials for mineral identification.

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Best Earnings Since 1923 Reported By Pittsburgh Coal Company

Reflecting both improved business conditions and higher prices for the product, the annual report of the Pittsburgh Coal Company showed that in 1940 the company earned a net profit of \$1,255,893, compared with a loss of \$1,068,786 in 1939. 1940 was the first year since 1934 in which the company showed a net profit, and from an earnings standpoint the showing was the best since 1923.

In the annual message to stockholders, Chairman Augustus K. Oliver and President J. B. Morrow say in part:

"Income from sales of coal and other operations increased from \$35,768,199 in 1939 to \$40,588,697 in 1940. Unusually cold weather from January through March was partly responsible for this gain, and an additional factor was higher industrial production throughout the year as a result of the demands occasioned by the European war and the defense program.

"The present high level of industrial production is not fully reflected in our sales, however, due to the fact that practically all of the coal tonnage used by steel producers and electric power companies in this area is mined by them from their own properties. As a result, only about 20 percent of our output is consumed in Western Pennsylvania, the balance being dis-

tributed in Eastern Ohio, Eastern Pennsylvania, New York, New Jersey, Delaware, Maryland, New England, Ontario, Quebec, and from docks on the St. Lawrence River and the Great Lakes.

"Our price realization increased 5.6 cents per ton over the previous year, the comparative increase being accelerated after October 1 when fixed minimum prices under the National Bituminous Coal Act became effective. On the other hand, the prices established by the Act appear to have resulted in some narrowing of the company's markets on certain grades of coal.

"The ultimate effects of the Act on the company are difficult to determine, however, until the price and coordination setup has had a further period of trial and until it becomes clear to what extent the present demand for coal is affected by national defense expenditures. The picture is further confused by the fact that the Act expires on April 26, 1941. At this writing a bill extending the Act for a two-year period is awaiting action by Congress.

"Of a total of 17 mines owned by the company, exclusive of leased mines and Eureka Mine, which has been worked out and was abandoned in September, 14 operated and three were down during the entire year. The company produced 9,868,790 tons in 1940, an increase of approximately

one and one-quarter million tons over the preceding year. This increase closely paralleled the national coal production trend.

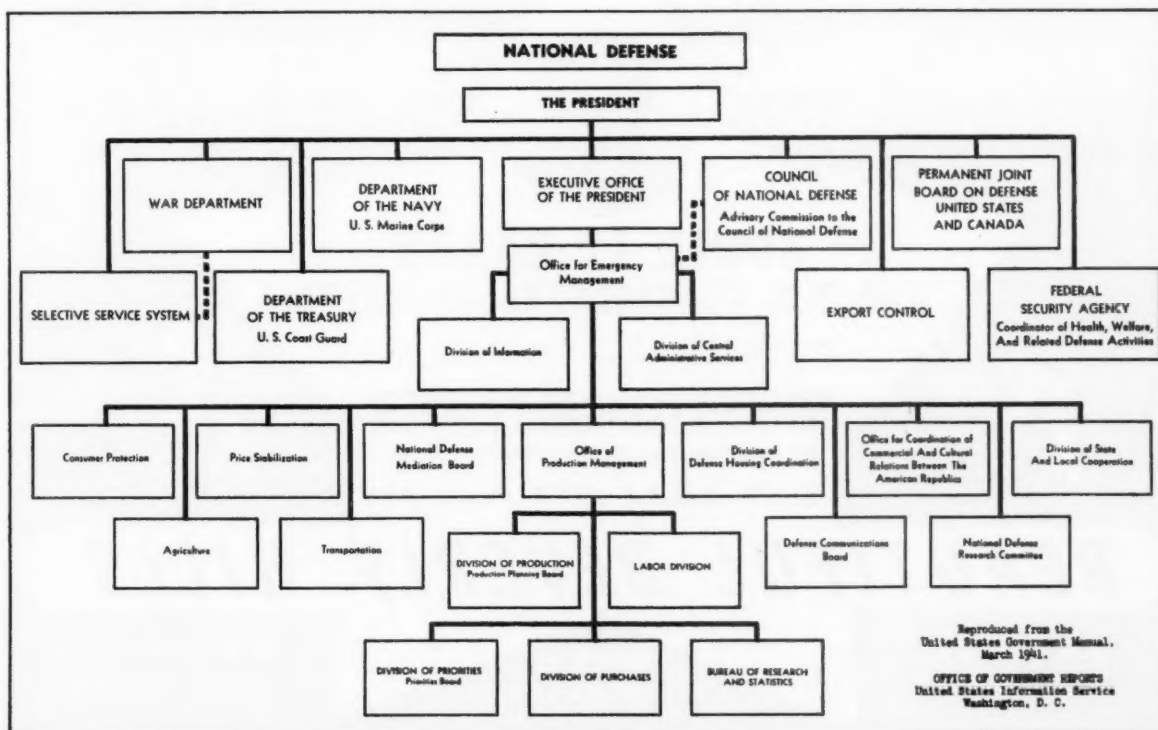
"During the year the program of mechanization to reduce cost of production was continued. Future large capital expenditures along this line will be necessary in order to place the company in a position to meet competitive conditions."

Aluminum from Alunite By New Process

In an address presented to the Washington Mining Institute at Seattle on January 24, Frank Eichelberger, mining engineer, who has been in charge of exploration work of the Kalunite Company, expressed the belief that metallic aluminum could be readily produced by a process developed by that company and utilizing extensive deposits of alunite in the western states. The company already has in operation in Utah a small plant for the production of alumina from alunite.

In a general way Mr. Eichelberger discussed chemistry of the Kalunite process and the mechanics of the operation. He also described new deposits of alunite which are a possible source of raw material. One deposit is at Marysville, Utah, and another is at Enumclaw, Wash.

DIAGRAM OF GOVERNMENTAL SET-UP FOR NATIONAL DEFENSE



Tipple to be Remodeled

The steel tipple at Montour No. 4 mine, Lawrence, Pa., of the Pittsburgh Coal Company, is to be completely remodeled by July 1 to handle run-of-mine at the rate of 1,000 tons per hour. Revolving dump, screening and picking facilities, and rock disposal equipment are to be installed. Roberts and Schaefer Company, Chicago, are to do the work.

Bituminous Coal Production Continues at High Rates

To the latter part of March the weekly production of bituminous coal continued at a high rate. For only three weeks of the period since the beginning of the year has the weekly production fallen below 10,000,000 tons. For the week ending March 15, the production was 11,150,000 net tons, or an estimated 92.9 percent of the present mine capacity. Production for the corresponding week of 1940 was 8,442,000 net tons, and in 1939 was 7,792,000 tons. The percentage increase over 1940 was 32.1 percent; over 1939, 43.1 percent.

For the week ending March 8, the weekly production for 1941 surpassed for the first time this year, the weekly production figures for the corresponding period of 1929, while in 1929 the

production trend at this period was sharply downward.

This is encouraging news for the industry, but is not to be interpreted in too sanguine a fashion. In part, the high production rate reflects the increasing pace of industry including the heavy demands for coke on the part of the steel industry, but to a greater extent this high rate undoubtedly reflects stocking on the part of consumers in anticipation of a possible stalemate in the contract negotiations under way between the coal operators and the miners.

Special Process for Magnesium Production To Be Tested

In a recent report to Secretary of the Interior Harold L. Ickes, Dr. R. R. Sayers, director of the Bureau of Mines, said that the Bureau is ready to proceed with initial tests of a special process it is developing for the production of magnesium metal, vital for defense purposes. The report said that extensive experimentation in the laboratory by metallurgists of the Bureau on a method for the direct production of magnesium from magnesite ore has proved encouraging enough to warrant trying out the process on an engineering scale.

The director added that no commercial plant in the United States utilizes such a process, and that only three

other plants in the world are reported to employ a method similar to that being developed by the Bureau.

If the operations at the Bureau's small pilot plant, which is designed to produce from 50 to 100 pounds of the metal daily by the electrothermic method, are successful, sufficient data may be made available to determine the feasibility of production on a larger or commercial scale.

The information which the Bureau has gathered to date is not sufficient to permit the design of a large producing plant or to furnish a reliable estimate of the cost of producing magnesium by the electrothermic method on a commercial scale.

Magnesite ore, which the Bureau's process utilizes, is found in abundance in a number of areas throughout the United States, and some of the largest deposits, variously estimated as from three to seven million tons, are situated in the State of Washington. Brucite, dolomite and many other common minerals contain magnesium in appreciable amounts, the report explained.

New Mining Development

Modern equipment has been installed by Raven Coal, Inc., a new mining development in Tazewell County, Va., and operations on a large scale are now beginning.

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MINING CONGRESS JOURNAL

Bituminous Coal Division Rules on Contracts

The Bituminous Coal Division of the Department of the Interior has issued a final order to permit petitioning Lake Michigan and Superior coal dock operators to fulfill contracts made prior to October 1, 1940, the date minimum prices became effective, at contract prices, which are lower than the effective minimums.

The order limits sales at the contract prices to coal stored on the docks prior to October 1, 1940, which is delivered in fulfillment of such contracts. It permits sales at contract prices to continue during the life of approved contracts but not to exceed a year from the date of the contract. These contracts are between various dock operators and numerous consumers. The order replaces several previously issued orders granting temporary relief on certain railroad fuel contracts.

The order was issued following a public hearing on the request of companies operating docks on the two lakes. The companies included:

Carnegie Dock & Fuel Co., Cleveland-Cliffs Dock Co., Hickman-Williams & Co., Inland Coal & Dock Co., M. A. Hanna Coal & Dock Co., Philadelphia & Reading Coal & Iron Co. and Pittsburgh Coal Co., all of Minneapolis.

Clarkson Coal Co., Great Lakes Coal & Dock Co., Northern Coal & Dock Co., North Western Fuel Co., all of St. Paul.

Pickands Mather & Co., Duluth.

Milwaukee Western Fuel Co., Youngioghney & Ohio Coal Co., North Western Fuel Co., Milwaukee Fuel and Dock Co., Wisconsin Ice & Coal Co., United Coal and Dock Co., Arthur Kuesel Coal Co., Leszczynski Fuel Co., Wisconsin Great Lakes Coal and Dock Co. and Schneider Fuel and Supply Co., all of Milwaukee.

In his opinion, Director Howard A. Gray of the Division pointed out that consumers in the Northwest usually make annual contracts with dock operators to assure that a coal supply adequate to meet their needs will be stored on the docks during the navigation season. The Lakes are frozen about five months each year, and boats cannot be operated.

The coal covered by the order had been stored by the dock operators to meet such contracts, and largely paid for, prior to the date minimum prices became effective. The minimum prices were higher than the rates provided in the contracts, and dock operators asked the Division to permit fulfillment of the contracts at the old prices.

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<i>Parkview</i>	<i>Sinton</i>

CINCINNATI HOTELS ASSOCIATION

Large River Loading Tipple and Preparation Plant for Duquesne Light Company Mine

At their mine near Greensboro, Pa., the Duquesne Light Company are constructing a steel river loading tipple and preparation plant with a capacity of 600 tons per hour of run-of-mine coal. The plant will be equipped with RandS revolving dump and trip feeder, rock disposal machinery, picking and crushing facilities for lump coal, Hydro-Separator coal washing equipment for 5 x 1 in. coals, complete sludge recovery equipment, and with a belt conveyor to the river and loading boom to barges. In conjunction with this plant a 50,000 gallon steel water tank will be erected, and complete pumping, piping and fire hydrant facilities installed. The entire contract has been awarded to Roberts and Schaefer Company, Chicago.

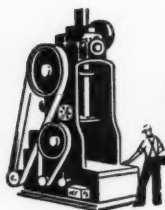
Montana Chromite Studied

Possible domestic sources of chromite are being studied with the end in view that if war comes to this country and we are cut off from sources of import, the United States will have a domestic source of supply.

The low-grade chromite deposits of Montana are among those which seem

to hold the greatest promise for the future and on which work is now being done. The deposits lie principally in the Beartooth range, north of the Wyoming line near Yellowstone Park. Various optimistic estimates have been made of the total quantity of ore available in the several districts considered, but the total is not known as yet and depends to a great extent upon the amenability of the ores to concentration. The ores are practically all below commercial grade and successful exploitation awaits the discovery or installation of a commercial concentration process.

Attention was drawn to these facts by the recent report that the government was negotiating with the Anaconda Copper Mining Company for the development of some of these chrome deposits. It is said that the Anaconda Company has been experimenting with concentration methods, with a view to finding some method by which the low-grade ores can be economically handled. The Bureau of Mines has conducted concentration tests at the Salt Lake City station, as described in the bulletin "Electric Furnace Smelting of Domestic Chrome Ores." Another report is that the Chrome Mining & Smelting Company of Hamilton, Ontario, is interested in these deposits with the expectation that the Udy process may be employed.



MANUFACTURERS' Forum

New M. S. A. Protective Devices

Announcement is made by Mine Safety Appliances Company, Pittsburgh, Pa., of the new M. S. A. Dustfoe-Eyeshield Assembly and Comfo-Eyeshield Assembly. These units furnish approved respiratory protection against even invisible particles of harmful dust, and guard the wearers' eyes from flying dust and grit by a light, durable, transparent plastic shield, states the manufacturer.

The M. S. A. Eyeshield is designed



to deflect small flying particles, and affords full, unobstructed vision. It is removable and replaceable and has a rubber-reinforced edge.

All the advantages of the popular Dustfoe Respirator are retained in the M. S. A. Dustfoe-Eyeshield Combination. The respirator is compact, permits unobstructed vision in every direction, and features U. S. Bureau of Mines approved protection against harmful dusts, low breathing resistance, easy maintenance, soft sponge-rubber face cushion, foolproof exhalation valve and protective filter cover. The "all-dusts" filter is quickly replaceable. Metal parts are aluminum.

In the M. S. A. Comfo-Eyeshield Assembly, the wearer has the complete protection provided by the husky, long-time favorite Comfo Respirator. The unit is equipped with twin filters of unusually large area for low breathing resistance. The replaceable filters are protected by metal covers, and the flexible rubber facepiece provides a comfortable fit on any face. All filters either for dust, fumes or mist, are approved by the U. S. Bureau of Mines.

These compact new M. S. A. assemblies offer day-long wearing ease and

safety to workers in dust-laden atmosphere, furnishing full respiratory safety plus durable eye protection.

For complete details on the M. S. A. Dustfoe Eyeshield Assembly and M. S. A. Comfo-Eyeshield Assembly, write to this publication, or direct to Mine Safety Appliances Co., Brad-dock, Thomas and Meade Streets, Pittsburgh, Pa. Ask for Bulletin No. CR-7.

Hydrotator Process to be Handled By Roberts and Schaefer

Roberts and Schaefer Company have announced the addition to their line of coal cleaning equipment, the Classifier and Hydrotator Preparation Process for cleaning of fine coals and refuse from existing washeries, now being distributed by the Wilmot Engineering Company of Hazleton, Pa., in the anthracite field.

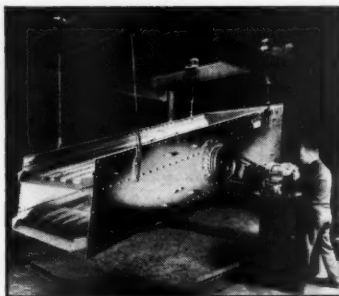
The Hydrotator Company have granted to Roberts and Schaefer Company the exclusive license of the Classifier-Hydrotator Process for the bituminous field.

Mr. W. L. Remick, formerly with the Hydrotator Company and Wilmot Engineering Company, will be in charge of, and act as contracting engineer for Roberts and Schaefer Company in the further exploitation and development of this process.

Vibrating Screen Announced by Allis-Chalmers

The Crushing and Cement Division, Allis-Chalmers Mfg. Company, Milwaukee, Wis., has developed a new vibrating screen called the "Ripl-Flo," which is said to involve a new principle of operation.

Having an eccentric shaft working with the unbalanced force of the



counterweighted flywheels, the new mechanism vibrates the entire screen body in rapid, circular, gyratory motion. Its smooth operating character-

istics, high capacity, and neat compact design make it especially suitable for screening coal, coke, sand, gravel, stone, ore, chemical products and other granular materials.

Like other screens designed by Allis-Chalmers, the equipment may be supported by cables attached to an overhead structure or to existing overhead building member. Structural floor mounted bases can be provided where this type of mounting seems preferable.

This screen will be built in single and double deck types in sizes up to and including 6 x 14 ft. The single deck screen is so designed as to permit easy change-over to a double deck screen, in the field, should the occasion arise. Bulletin B-6151, giving further details, is available on request.

Clamps for Hollow Copper Cables

Completing its line of suspension and strain clamps for hollow copper cables, the Ohio Brass Company, Mansfield, Ohio, now has suitable de-



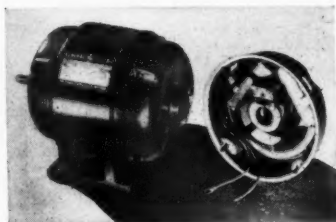
signs for any type, size or make of cable. These clamps meet the recommendations and requirements of the copper cable manufacturers. The two suspension clamps illustrated are typical of the designs developed to meet hollow cable requirements. Strain clamps for hollow copper cable include the principal design features of the company's standard clamps, known as Hi-Lites. Clamp bodies and fittings are made of malleable iron, Flecto-processed to prevent embrittle-

ment during galvanizing. Nuts, bolts and rivets are of steel. Iron and steel parts are hot-dip galvanized. Copper liners are furnished with all clamps.

General Electric Offers New Tri-clad Capacitor Motor

As an extension of its recently announced line of new polyphase induction motors, General Electric now offers a new Tri-Clad capacitor motor designed to meet a large number of varied industrial applications. Like the polyphase Tri-Clad motor, this capacitor motor features modern appearance, and better mechanical and electrical protection as well as protection against operating wear and tear.

The new capacitor motor may be obtained with either ball-bearing or sleeve-bearing construction, and is



available in two types, Type KC and Type KCJ. The Type KC is designed particularly for applications requiring moderate starting torques such as fans, blowers, and centrifugal pumps. The Type KCJ is designed for compressors, loaded conveyors, reciprocating pumps, and any other applications requiring high starting torque. The capacitors are mounted inside the end shield on the normal-torque motor, while on the high-starting torque motor, 1½ hp. and larger, the capacitors are mounted in a compact case on top of the motor frame.

In both of its forms, the capacitor motor incorporates all of the protective features of the Tri-Clad line: (1) complete mechanical protection through the use of a cast-iron frame, (2) electric protection made possible by the use of Formex wire in the magnet coils, and (3) improved bearing design and lubricating arrangements. It also utilizes the cast-aluminum rotor and double-end ventilation. In addition, it offers many convenience features.

The protected frame and end shields minimize contact of vital motor parts with foreign material while also protecting it against accidental blows in handling or similar rough usage. The new type Formex insulation, dust-tight bearings, and the use of Glyptal in the priming and finishing paints armor it against the attack of harmful agents.

Streamlined Switch Signal

The Portable Lamp & Equipment Co., 77 First Avenue, Pittsburgh, Pa., announces a Streamlined Switch Signal, latest addition to the company's

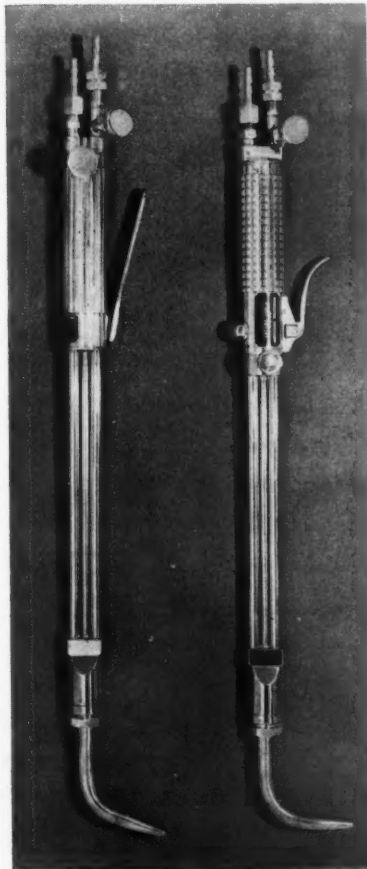
"Track Tackle Line" of haulage safety devices. According to the manufacturer, the new signal is almost 50 percent lower in initial cost than other signals, and in addition, requires practically no upkeep.

Described by the concern's recently issued Track Tackle Bulletin No. 5, the new product was introduced to increase safety and efficiency in underground haulage. Small, streamlined and foolproof, it employs red and green reflector discs instead of the usual electric lights, thus doing away with electric wiring, broken bulbs and lenses. Reflector discs are visible from both sides of the signal, so that they can be seen by motormen approaching from either direction.

New Riser Cutting Apparatus

In response to an increasing demand for greater convenience in removing riser heads from metal castings, Air Reduction has just introduced a new line of hand cutting apparatus. This apparatus consists of two torches and three tips.

The new torches, Styles 3180 and



9080, are of the straight head type. Both have monel metal heads and stainless steel tubes for longer life; each is 21 inches in length. Cutting oxygen can be controlled by either a

lever or trigger, and the type selected can be placed on top, on either side, or on the bottom of the torch to suit the convenience and comfort of the individual operator.

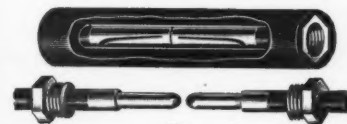
The new cutting tips are known as Style 187 bent to 75 degrees; Style 181 bent to 90 degrees, and Style 191, which is a straight tip, 7 in. long. Style 191 is not illustrated. They are designed to permit greater maneuverability in the restricted areas and cramped quarters frequently encountered in riser cutting. The shorter length from the end of the tip to the bend makes this possible.

Further information about this new equipment may be obtained by writing to Air Reduction, 60 East 42nd Street, New York, N. Y.

Safeway Cable Connector

In electrical wiring, "Safety First" is an essential feature, but to assure this, all of the many parts that go to make up the complete assembly must be taken into consideration. One very important point is the contact to be used at wire and cable terminals.

Realizing the importance of this, and after consultation with a number of plant superintendents and electrical engineers, the Tamping Bag Co., Mt. Vernon, Ill., cooperating with the Daniel Woodhead Company, Chicago, Ill., developed a set of male and fe-



male connectors ranging from 50 to 250 amperes, both single and multiple type. The metallic contact parts of these connectors are molded into a high quality oil and heat resisting rubber compound, making them weatherproof. The female connector has a brass tube, with special positive spring contacts, one to receive the male contact and one in the cable end to receive a contact soldered to the cable.



The male connector is molded with brass pin extension for inserting into the female part, also having a spring contact for the cable. Both connectors have a stuffing box, making them watertight where cables enter, and a special forced rubber joint on the opposite end for weatherproofing the unit. For a positive waterproof type, the connector having a stuffing box on both ends is recommended.

This new connector is designed to receive the cable—just remove from ¼ to ½ in. of the insulation and solder copper into the end of the contact pin. No taping is necessary.

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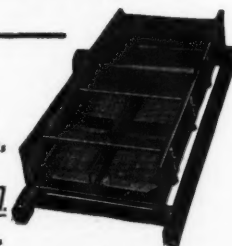
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